Hazardous Waste Section

File Room Document Transmittal Sheet

Name:	Mary Siedlecki
EPA ID Number:	NCD072022726
Facility Name:	International Paper Wilmington Facility
Document Group:	Permit
Document Type:	Permit
Description:	Hazardous Waste Management Permit
Date of Document:	06/10/2014
Author(s) of Doc:	NC DENR HWS

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

June 10, 2014

Mr. Tom Richardson
Corporate EHS Remediation Project Manager
International Paper
6400 Poplar Avenue
Memphis, Tennessee 38197

Subject: RCRA Class I Permit Modification
International Paper
2221 JR Kennedy Drive
Wilmington, North Carolina
EPA Id Number: NCD 072 022 726

Dear Mr. Richardson:

Your request for a permit modification to reduce groundwater sampling frequency from semi-annually to annually has been approved as a Class I permit modification under 40 CFR 270.42, as adopted in 15A NCAC 13A .0113. The reduction in sampling frequency has been incorporated into the attached permit which supersedes all previous versions of this document. Please replace the previous version of the document with the enclosed permit. Additionally, please replace Modules E, F, and I in the permit application in their entirety.

To comply with 40 CFR 270.42, you must notify all parties on the enclosed mailing list of the permit modification, with the exception of State and EPA representatives who have already been notified. Please provide the updated permit and application information to the persons on the attached mailing list within thirty (30) days upon receipt of this letter.

If you have any questions or comments, please contact Mary Siedlecki at 919-707-8208 or via email at mary.siedlecki@ncdenr.gov.

Sincerely,

Julie Woosley, Hazardous Waste Section Chief
Division of Waste Management, NCDENR

Enclosures: Permit
Permit Modification Log Sheet
Permit Application Modules E, F, and I
Mailing List

ec: Tom Richardson, International Paper Facility Manager
Jon D. Johnston, US Environmental Protection Agency, Region 4
Gwen Gleaton, US Environmental Protection Agency, Region 4
John Johnston, US Environmental Protection Agency, Region 4
Bud McCarty, Hazardous Waste Section Branch Manager
Bobby Nelms, Hazardous Waste Section Inspector
Mary Siedlecki, Hazardous Waste Section Project Manager
Kathleen Lawson, Hazardous Waste Section Permit Tracker
Vernon Keys, URS
Walter Plekan, URS

[IPaper2014.MS]

I.D. NUMBER NCD 072 022 726 R
PERMIT NO. NCD 072 022 726 R1

DATE ISSUED September 26, 2008
DATE MODIFIED June 10, 2014

Hazardous Waste Management Permit

Permittee: International Paper
2221 J. R Kennedy Drive
Wilmington, NC 28405

Owner: International Paper
2221 J. R Kennedy Drive
Wilmington, NC 28405

Pursuant to the 15A NCAC 13A North Carolina Hazardous Waste Management Rules, a post-closure permit is issued to the Oracle International Paper facility located in the Cape Fear River Basin, Wilmington, New Hanover County on 2221 J.R. Kennedy Drive at latitude 34° 15'03" and longitude 77° 55' 26".

The Permittee must comply with all terms and conditions of the permit. This permit consists of the conditions discussed in Parts I, II, III, IV, V, VI, VII and VIII; the applicable regulations contained in 15A NCAC 13A including the applicable provisions of 40 CFR Parts 260 through 264, 266, 268, 270 and 124; statutory requirements of N.C.G.S. 130A -Article 9 (Solid Waste Management Act as amended) and the attached application.

Applicable regulations are those which are in effect on the date of issuance of this permit [40 CFR 270.32(c) as adopted in 15A NCAC 13A .0113] and are attached.

This permit is based on the assumption that the information submitted in the permit application and as modified by subsequent amendments (hereafter referred to as the Application) is accurate and that the facility will be operated as specified in the Application. Any inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action [40 CFR 270.41, 270.42, and 270.43 as adopted in 15A NCAC 13A .0113]. The Permittee shall inform the North Carolina Department of Environment and Natural Resources of any deviation from or changes in the information in the Application which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit was effective on September 26, 2008, and was revised on June 10, 2014, and shall remain in effect until September 26, 2018 [40 CFR 270.50 as adopted in 15A NCAC 13A .0113] unless revoked and reissued, terminated or continued in accordance with 40 CFR 270.51 as adopted in 15A NCAC 13A .0113.

Julie S. Woosley, Chief
Hazardous Waste Section

6/10/14
Date

The State of North Carolina
Department of Environment and Natural Resources
Division of Waste Management
Hazardous Waste Section

NCDENR
North Carolina Department of Environment and Natural Resources

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INTERNATIONAL PAPER POST-CLOSURE PART B APPLICATION

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PART I - STANDARD CONDITIONS

A. EFFECT OF PERMIT

The Permittee is allowed to conduct post-closure care and corrective action requirements in accordance with the conditions of this permit. Compliance with this permit constitutes compliance, for purposes of enforcement, with the N.C. Hazardous Waste Management Rules (15A NCAC 13A) and N.C.G.S. 130A-Article 9 (Solid Waste Management Act as amended). Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under any law governing protection of public health or the environment for any imminent and substantial endangerment to human health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 270.41, 270.42, and 270.43 as adopted in 15A NCAC 13A .0113. The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

D. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued under 40 CFR 270.61 as adopted in 15A NCAC 13A .0113. Any permit noncompliance constitutes a violation of N. C. Hazardous Waste Management Rules and N.C.G.S. 130A-Article 9 (Solid Waste Management Act as amended) and is grounds for enforcement action, permit termination, revocation and, reissuance, modification, or for denial of a permit renewal application.

2. Duty to Reapply. If the Permittee will continue an activity allowed or required by this permit after the expiration date of this permit, the Permittee shall submit a complete application for a new permit at least 180 days before this permit expires. The Permittee must continue post-closure monitoring and corrective action after the expiration date of this Permit unless permission to cease such activity has been granted by the Department.

3. Permit Review Period. This permit shall be reviewed by the Secretary of the Department of Environment and Natural Resources or his designee (hereafter referred to as Department) five (5) years

after the date of issuance and modified as necessary as required under 40 CFR 270.50(d) as adopted in 15A NCAC 13A .0113.

4. Permit Expiration. This permit and all conditions therein will remain in effect beyond the permit's expiration date and until a decision is made concerning issuance of a new permit if the Permittee has submitted a timely, complete application (see 40 CFR 270.10-270.29 and 270.10 as adopted in 15A NCAC 13A .0113) and through no fault of the Permittee, the Department has not issued a new permit as set forth in 40 CFR 124.15 as adopted in 15A NCAC 13A .0105.

5. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

6. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

7. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment, control, monitoring and remediation (and related appurtenances) used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of the permit.

8. Duty to Provide Information. The Permittee shall furnish to the Department, within a reasonable time, any relevant information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

9. Inspection and Entry. The Permittee shall allow the Department, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

   a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

   d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the

N.C. Hazardous Waste Management Rules, any substances or parameters at any location.

10. Monitoring and Records.

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the ground water to be analyzed must be an appropriate method and as described in the most recently approved Groundwater Sampling and Analysis Plan. Laboratory methods must be those specified in most recently approved Groundwater Sampling and Analysis Plan and Appendix A of this permit.

b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, and records of all data used to complete the Application for this permit for a period of at least three (3) years from the date of the sample, measurement, report or record. These periods may be extended by request of the Department at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

c. Records of monitoring information shall include:

i. The date, exact place, and time of sampling or measurements;
ii. The individual(s) who performed the sampling or measurements;
iii. The date(s) analyses were performed;
iv. The individual(s) who performed the analyses;
v. The analytical techniques or methods used; and
vi. The results of such analyses.

11. Reporting Planned Changes. The Permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions which may impact any Hazardous Waste Management Units (HWMUs), Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), or the areas contaminated by them, including voluntary corrective measures to the SWMUs or AOCs referenced in Appendix D at the permitted facility as defined in 40 CFR 270.2 as adopted in 15A NCAC 13A .0113.

12. Anticipated Noncompliance. The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with the requirements of this permit.

13. Transfer of Permits. This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to 40 CFR 270.40, 270.41 and 270.42 as adopted in 15A NCAC 13A .0113. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 40 CFR 264 as adopted

in 15A NCAC 13A .0109 and 40 CFR 270 as adopted in 15A NCAC 13A .0113.

14. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

15. Twenty-four Hour Reporting. The Permittee shall report to the Department any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. The following shall be included as information which must be reported orally within 24 hours:

    a. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

    b. Any information of a release or discharge of hazardous waste, or of a fire or explosion from the facility, which could threaten the environment or human health outside the facility. The description of the occurrence and its cause shall include:

        i. Name, address, and telephone number of the owner or operator;
        ii. Name, address, and telephone number of the facility;
        iii. Date, time, and type of incident;
        iv. Name and quantity of material(s) involved;
        v. The extent of injuries, if any;
        vi. An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and
        vii. Estimated quantity and disposition of recovered material that resulted from the incident.

    A written submission shall also be provided within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times), and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Permittee need not comply with the five-day written notice requirement if the Department, waives that requirement and the Permittee submits a written report within fifteen (15) days of the time the Permittee becomes aware of the circumstances.

16. Other Noncompliance. The Permittee shall repoRt all other instances of noncompliance not otherwise required to be reported at the time monitoring reports are submitted. The reports shall contain the information listed in Condition I.D.15.

17. Other Information. When the Permittee becomes aware that he failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Department, the Permittee shall promptly submit such facts or information.

E. SIGNATORY REQUIREMENTS

All reports or other information requested by the Department shall be signed and certified according to 40 CFR 270.11 as adopted in 15A NCAC 13A .0113.

F. DOCUMENTS TO BE MAINTAINED AT FACILITY SITE

The Permittee shall maintain at the facility, until post-closure and all RCRA corrective action activities are completed and certified by an independent registered professional engineer, the following documents and amendments, revisions and modifications to these documents:

1. Cost estimate for closure, post-closure care and corrective action submitted in accordance with 40 CFR 264.142(d), 264.144, 264.100, and 264.101 as adopted in 15A NCAC 13A .0109 and presented in Appendix I, attachments I-1 to I-7 of the Application;

2. Operating record required by 40 CFR 264.73 as adopted in 15A NCAC 13A .0109, and Conditions I.D.10., III.G., and IV.I. of this permit;

3. The most recently approved Sampling and Analysis Plan. The Post-Closure Plan and Corrective Measures Plan in Section E of the Application and Condition III.G., IV.H. and V.H of the permit;

4. Inspection schedules developed in accordance with 40 CFR 264.15(b) as adopted in 15A NCAC 13A .0109 and Section F-2 page F-2 of the Application;

5. Ground-water monitoring records necessary to develop reports required by 40 CFR 264.100 as adopted in 15A NCAC 13A .0109 and this permit;

6. Documentation of compliance with 40 CFR 264.116, 264.119, and 264.120 as adopted in 15A NCAC 13A .0109 and this permit;

7. A survey plat and record of the type, location and quantity of hazardous waste or hazardous constituents disposed of within the RCRA closed surface impoundment as required by 40 CFR 264.119 as adopted in 15A NCAC 13A .0109 and this permit; and

8. All reports and documentation of compliance with the post-closure plan as specified in 40 CFR 264.118(b)(1) and (2) as adopted in 15A NCAC 13A .0109 and this permit during the post-closure period and corrective action as specified in 40 CFR 264.100 and .101, as adopted in 15A NCAC 13A .0109 and as defined in Part I.I of this permit.

All amendments, revisions and modifications to any plan or cost estimates required by this permit shall be submitted to the Department for approval and/or permit modification.

G. BIENNIAL REPORT

The Permittee shall prepare and submit a biennial report by March 1 of each even numbered year in accordance with 40 CFR 264.75 as adopted in 15A NCAC 13A .0109. The biennial report must be submitted on EPA form 8700-13

A/B. The report must cover facility activities during the previous calendar year.

H. DOCUMENTS TO BE SUBMITTED

The Permittee shall submit three (3) copies of any documents described below:

1. The Permittee shall submit annual sampling analysis results no later than sixty (60) days after the sampling has been completed.

2. If the Permittee chooses to perform the statistical evaluation as described in Condition IV.F.9., the Permittee shall submit the statistical evaluation not later than sixty (60) days after completion of the sampling.

I. DEFINITIONS

For purposes of this permit, terms used herein shall have the same meaning as those in the North Carolina Hazardous Waste Management Rules and Solid Waste Management Law unless this permit specifically provides otherwise; where terms are not defined in 15A NCAC 13A, G.S. 130A-Article 9, the permit, or EPA guidance documents or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

Corrective Action shall be defined as all activities including activities conducted beyond the facility boundary, that are proposed or implemented to facilitate assessment, monitoring, and active or passive remediation of releases of hazardous waste or hazardous constituents to soil, groundwater, surface water, or the atmosphere associated with Hazardous Waste Management Units (HWMUs), Solid Waste Management Units (SWMUs), and/or Areas of Concern (AOCs) located at the facility or off-site, as required by 40 CFR 264.100 and 264.101 and adopted in 15A NCAC 13A .0109 or as otherwise required and specified by this permit.

J. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any information required to be submitted by this permit in accordance with 40 CFR 270.12 as adopted in 15A NCAC 13A .0113.

K. APPROVAL/DISAPPROVAL OF SUBMITTALS

The Department will review the work plans, reports, schedules, and other documents ("submittals") which require the Department's approval in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. Condition I.L. shall apply only to submittals that have been disapproved and revised by the Department, or have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.

L. DISPUTE RESOLUTION

Notwithstanding any other provisions in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by the permit, the following may, at the Permittee's discretion, apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within thirty (30) days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth the specific matters in dispute, the position the Permittee asserts should be adopted as consistent with the requirements of the permit, the basis for the Permittee's position, and any matters considered necessary for the Department's determination.

2. The Department and the Permittee shall have an additional thirty (30) days from the Department's receipt of the notification provided for in Condition I.L.1. to meet or confer to resolve any disagreement.

3. In the event an agreement is reached, the Permittee shall submit the revised submittal and implement the same in accordance with and within the time frame specified in such agreement.

4. If agreement is not reached within the thirty (30) day period, the Department will notify the Permittee in writing of his/her decision on the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Chief of the Hazardous Waste Section.

   Invoking any of the dispute resolution procedures of this section does not preclude the Permittee from exercising any of its other rights to petition for a contested case hearing or appeal in accordance with N.C. General Statute 150B. Nor does invoking any of the dispute resolution procedures of this section extend or delay the time periods in which the Permittee must exercise any of those other rights to petition or appeal.

5. With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of the permit that the Department determines are not affected by the dispute.

PART II - GENERAL FACILITY CONDITIONS

A. Authorized Waste. The Permittee is authorized to monitor and treat ground water and implement post-closure care and corrective action of the closed surface impoundment (former tank farm) in accordance with the conditions specified in this permit.

B. Design and Operation of Facility. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous constituents to air, soil or surface water which could threaten human health or the environment.

C. Security. The Permittee shall comply with the security provisions of 40 CFR 264.14(b) and (c) as adopted in 15A NCAC 13A .0109 and Section F-1 of the Application.

D. General Inspection Requirements. The Permittee shall follow the inspection schedule as described in Section F-2 of the Application and shall comply with 40 CFR 264.15(c) and (d) as adopted in 15A NCAC 13A .0109.

E. Record Keeping and Reporting.

1. Operating Record. The Permittee shall maintain a written operating record at the facility in accordance with 40 CFR 264.73(a), and (b)(3), (b)(4), (b)(5), (b)(6), (b)(8), (b)(9), (b)(10), and (b)(17) as adopted in 15A NCAC 13A .0109, and as described in the most recently approved groundwater Sampling and Analysis Plan.

2. Biennial Report. The Permittee shall comply with the biennial report requirements of 40 CFR 264.75 as adopted in 15A NCAC 13A .0109 and 15A NCAC 13A .0101.

3. Post-Closure Cost Estimate. The most recent estimate for closure, post-closure care, investigation, and corrective action under 40 CFR 264.142(d), 264.144, 264.100 and 264.101(b) as adopted in 15A NCAC 13A .0109, must be submitted each year in accordance with 40 CFR 264.145 as adopted in 15A NCAC 13A .0109.

F. Post-Closure. The Permittee shall monitor, maintain, and perform post-closure care of the facility as described in Section I-2 of the Application, and as required under 40 CFR 264.117 and 264.310 as adopted in 15A NCAC 13A .0109.

G. The Permittee shall perform Corrective Action as required under 40 CFR 264.100 and 264.101 as adopted in 15A NCAC 13A .0109 and the approved remedy in V.I of this permit.

H. Cost Estimate for Post-Closure. The Permittee's current post-closure cost estimate, prepared in accordance with 40 CFR 264.144(a) as adopted in 15A NCAC 13A .0109, is specified in Sections I-5 to I-9 of the Application.

1. The Permittee must annually adjust the post-closure cost estimate for inflation within sixty (60) days prior to the anniversary date of the establishment of the financial instrument/thirty (30) days after the close of the Permittee's fiscal year as required by 40 CFR 264.144(b) as adopted in 15A NCAC 13A .0109.

2. The Permittee must revise the post-closure cost estimate whenever there is a change in the facility's Post-Closure Plan as required by 40 CFR 264.144(c) as adopted in 15A NCAC 13A .0109.

3. The Permittee must keep at the facility the latest post-closure cost estimate as required by 40 CFR 264.144(d) as adopted in 15A NCAC 13A .0109.

4. The Permittee shall amend the cost estimate to include cost of operation and maintenance of any ground-water monitoring or corrective action programs that may be implemented in the future in lieu of the monitoring requirements in this permit.

I. Financial Assurance for Facility Post-Closure. The Permittee shall demonstrate continuous compliance with 15A NCAC 13A .0109(i) and 40 CFR 264.145 as adopted in 15A NCAC 13A .0109, or where applicable with 40 CFR 264.146, 264.149, 264.150, and 264.151 as adopted in 15A NCAC 13A .0109 and State Rule .0109(i) by providing documentation of financial assurance in at least the amount of the cost estimates required by Condition II.G. and Section N of the Application.

The financial mechanism used shall be that instrument specified in Section N of the Application. The Permittee may propose using a different mechanism by submitting a new financial instrument to the Department for approval. The Permittee must submit this documentation no later than sixty (60) days prior to the effective date of the proposed change. The existing financial mechanism shall remain in force until the change is approved.

J. Cost Estimate for Corrective Action.

1. The Permittee shall prepare a cost estimate for the completion of any corrective action required under this permit for solid waste management units in order to provide financial assurance for completion of corrective action as required under 40 CFR 264.90(a)(2) and 264.101(b) as adopted in 15A NCAC 13A .0109. Such cost estimate will be based upon the cost of assessment of soil and ground water, installation, operation, inspection, monitoring, and maintenance of the corrective action system to meet the requirements of 40 CFR 264.100 and 264.101 as adopted in 15A NCAC 13A .0109 and this permit to include any treatment system necessary for contaminated soil and/or ground water. Such cost estimate will include the full cost (100%) of corrective action as defined by Part I.I of this permit.

2. The Permittee shall submit the cost estimate for completion of corrective action required under 40 CFR 264.90(a)(2), 264.100 and 264.101 as adopted in 15A NCAC 13A .0109 and this permit within one hundred eighty (180) days of the approval of this permit.

3. The Permittee shall annually adjust the cost estimate for inflation sixty (60) days prior to the anniversary date of the establishment of the financial assurance mechanism unless using a financial test or corporate guarantee, in which case the estimate shall be updated thirty (30) days after the close of the firm's fiscal year.

4. The Permittee shall submit cost adjustments for modifications to the corrective action plan to the Section within thirty (30) calendar days after receiving approval of the modification if the change increases the cost of corrective action.

K. Financial Assurance for Corrective Action.

1. The Permittee shall demonstrate continuous compliance with 40 CFR 264.90(a)(2) and 264.101 as adopted in 15A NCAC 13A .0109 by providing documentation of financial assurance using a mechanism described in 40 CFR 264.151 and 264.145 as adopted in 15A NCAC 13A .0109 or a mechanism described in 15A NCAC 13A .0109(i) in at least the amount of the cost estimate required under Condition II.J of this permit.

2. The Permittee shall submit financial assurance for the full cost of corrective action as required under 40 CFR 264.90(a)(2), 264.100 and 264.101 as adopted in 15A NCAC 13A .0109 no later than sixty (60) days after the submittal of the cost estimate described in II.J of this permit.

3. Only the mechanisms described in 15A NCAC 13A .0109(i) may be used for financial assurance for corrective action. References to regulatory requirements for "closure and/or post-closure care" shall be replaced with the phrase "closure, post-closure care, and/or corrective action."

L. Incapacity of Owners or Operators, Guarantors, or Financial Institutions.

The Permittee shall comply with 40 CFR 264.148 as adopted in 15A NCAC 13A .0109 whenever necessary.

M. Special Conditions.

1. When a discrepancy exists between the wording of an item in the Application and this permit, the permit requirements take precedence over the Application.

2. When a discrepancy exists between the RCRA Facility Assessment (RFA) report (attached as part of the permit) and this permit as to the future requirements to be taken at the facility, the permit requirements take precedence over the requirements proposed in the report.

PART III - POST-CLOSURE CARE

A. APPLICABILITY

The conditions of this Part apply to the closed surface impoundment (former tank farm) as specified in 40 CFR 264.110(b)(2) as adopted in 15A NCAC 13A .0109.

B. POST-CLOSURE CARE PERIOD

Post-closure care procedures as described in Section I-2 of the Application and Part IV of this permit shall continue throughout the effective period of this permit as specified in 40 CFR 264.117(a)(1) as adopted in 15A NCAC 13A .0109, unless otherwise modified under 40 CFR 264.117(a)(2) as adopted in 15A NCAC 13A .0109.

C. GROUND-WATER MONITORING AND CORRECTIVE ACTION

During the post-closure period the Permittee shall comply with the requirements of 40 CFR 264.91 through 264.100 as adopted in 15A NCAC 13A .0109 as specified under Part IV of this permit for purposes of detecting, characterizing, and responding to releases of hazardous constituents to the uppermost aquifer for the closed areas as described in Section E of the Application and in Appendix E.

D. POST-CLOSURE CARE

1. The Permittee shall monitor and maintain the area that closed pursuant to 40 CFR Subpart G after January 26, 1983, for a minimum of thirty (30) years in accordance with Condition II.F. and as required under 40 CFR 264.117-120, 264.228, and 264.310 as adopted in 15A NCAC 13A .0109 and as described in the post-closure plan located in Section I-2, Appendix I of the Application.

2. The Permittee shall provide and maintain the items required by Conditions IV.G.8. and IV.G.9. of this permit as to the operation and maintenance of the remedial action system.

E. FINANCIAL ASSURANCE FOR POST-CLOSURE

The Permittee shall not reduce the amount of Financial Assurance for Post-closure Care below $1,260,193 without certification as specified in the North Carolina Hazardous Waste Section Guidance on Post-closure Financial Assurance. The Permittee shall maintain compliance with Conditions II.H. and II.I, in the event of any revisions to the post-closure cost estimate due to additional post-closure care requirements. The Permittee shall amend the cost estimate to include cost of operation and maintenance of any ground-water monitoring or corrective action programs that may be implemented in the future in lieu of the monitoring requirements set forth in Part IV of this permit.

F. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION

The Permittee shall provide financial assurance for completion of corrective action, as defined in Part I.I, for all regulated land disposal units that received hazardous waste after July 26, 1982, and for Solid Waste Management Units as specified in Condition II.J and II.K.

G. REPORTING, RECORD KEEPING, AND RESPONSE

The Permittee shall enter all monitoring, testing, analytical data, inspection, and maintenance reports obtained pursuant to Condition IV.I. in the operating record, as required by 40 CFR 264.73(b)(6) as adopted in 15A NCAC 13A .0109.

PART IV - GROUND-WATER PROTECTION

A. APPLICABILITY

The requirements of this part apply to the closed area as described in Section B of the Application and as specified under 40 CFR 264.90 as adopted in 15A NCAC 13A .0109.

B. GROUNDWATER PROTECTION STANDARD

The groundwater protection standard as required under 40 CFR 264.92 as adopted in 15A NCAC 13A .0109 shall consist of Table IV-I below, which lists the hazardous constituents and their respective concentration limits as required under 40 CFR 264.93, and 264.94, respectively.

TABLE IV-I GROUNDWATER PROTECTION STANDARDS

Hazardous Constituents	Concentration Limit	Reference
Acetone	700µg/L	NC 2L
2-Butanone (Methyl Ethyl Ketone-MEK)	4200µg/L	NC 2L
Benzene	1.0µg/L	NC 2L
Chlorobenzene	50µg/L	NC 2L
Ethyl benzene	550µg/L	NC 2L
2-Hexanone	280µg/L	NC 2L
4-Methyl 1-2-Pentanone (MIBK)	50µg/L	Appendix IX
Toluene	1000µg/L	NC 2L
Xylenes (total)	530µg/L	NC 2L
Benzoic Acid	28000µg/L	NC 2L
Benzyl Alcohol	20µg/L	Appendix IX
1, 2 Dichlorobenzene	24µg/L	NC 2L
2-Methy Phenol (o-cresol)	10µg/L	Appendix IX
4-Methyl phenol (p-cresol)	3.5µg/L	NC 2L
Naphthalene (SVOA)	21µg/L	NC 2L
N-nitrosopiperidine	10µg/L	Appendix IX
Phenol	300µg/L	NC 2L
Vinyl Chloride	0.015µg/L	NC 2L

C. POINTS OF COMPLIANCE

The point of compliance for the closed hazardous waste management unit shall be monitoring well number POC-01 as described in Condition IV.E. and Appendix B and as required by 40 CFR 264.95 and 264.99(a)(3) as adopted in 15A NCAC 13A .0109.

D. COMPLIANCE PERIOD

The compliance period shall be defined to begin on July 25, 1997 and continue for the greater of: 30 years; or until the groundwater protection standard, specified in Condition IV.B., has not been exceeded for a period of three (3) consecutive years and the corrective action under 40 CFR 264.100 as adopted in 15A NCAC 13A .0109 has been terminated as specified under Condition IV.J. of this permit.

E. GROUNDWATER MONITORING SYSTEM

The Permittee shall install and maintain a groundwater monitoring system to comply with the requirements of 40 CFR 264.97, 264.99, and 264.100 as adopted in 15A NCAC 13A .0109.

1. The Permittee shall maintain groundwater monitoring wells for:

   a. Point of compliance monitoring: Monitoring well POC-1 shall be the point of compliance as depicted on Figure E.1.1 in Module E of the Application and in Appendix B of this permit. POC-1 shall be monitored in accordance with the most recently approved groundwater Sampling and Analysis Plan.

   b. Corrective Action Effectiveness Monitoring: Shallow monitoring wells (MW-09, MW-21, MW-22, MW-23, MW-24, MW-25, MW-31, MW-32, MW-34, MW-35, and MW-36) and deep monitoring well (MW-10) shall be monitored in accordance with the most recently approved Sampling and Analysis Plan to evaluate plume stability and corrective action effectiveness.

2. The Permittee shall install and maintain any additional groundwater monitoring well(s) for the purposes of determining the effectiveness and progress of the corrective action system as required by 40 CFR 264.100(d) as adopted in 15A NCAC 13A .0109. The plans for the design, location, installation, and development of any additional wells shall be submitted to the Department for approval at least thirty (30) days prior to the desired installation date.

F. MONITORING REQUIREMENTS

The Permittee shall establish and implement a groundwater monitoring program to demonstrate the effectiveness of the corrective action program. Groundwater monitoring shall be conducted in conformance with the requirements for compliance monitoring considering 40 CFR 264.92, 264.99 and 264.100 as adopted in 15A NCAC 13A .0109. The Permittee shall determine groundwater quality as follows:

1. The Permittee shall collect, preserve, and analyze groundwater samples pursuant to Condition IV.H.

2. The Permittee shall determine the concentration of hazardous constituents specified in Condition IV.B., pH, conductivity, temperature, and water level of the groundwater at each well as described in the most recently approved groundwater Sampling and Analysis Plan and in Appendix A of this permit throughout the compliance period including any extension to the compliance period as defined under Condition IV.D.

3. To demonstrate the effectiveness of the corrective action program, the Permittee shall monitor wells in accordance with the most recently approved Sampling and Analysis Plan and Appendix A of this permit. The Permittee shall comply with any additional monitoring specified by the Department as required by 40 CFR 264.100(d) as adopted in 15A NCAC 13A .0109.

4 The Permittee shall record the water level in all wells being sampled before the groundwater is sampled each time in accordance with Conditions IV.F.2 and IV.F.3.

5. The Permittee shall determine the groundwater flow rate and direction in the uppermost aquifer at least annually as required under 40 CFR 264.99(e) as adopted in 15A NCAC 13A .0109. This information shall be submitted in the form of a groundwater potentiometric map, and groundwater velocity calculations, along with all the data used to make these determinations.

6. The Permittee shall analyze samples from the point of compliance well(s), specified under Condition IV.C., all constituents in 40 CFR 264 Appendix IX, or a reduced set of constituents approved by the Department, as adopted in 15A NCAC 13A .0109 and any other constituents specified by the Department at least every five years beginning five (5) years from the effective date of the permit to determine whether additional hazardous constituents are present in the uppermost aquifer. The analyses must be submitted within 120 days of sampling. If the Permittee finds additional constituents present (one not listed in Condition IV.B.), he or she may re-sample within one (1) month and repeat the analysis. If the second analysis confirms the presence of new constituents their concentrations shall be reported to the Department within seven (7) days after completion of the analyses.

7. If analysis of samples taken in accordance with Conditions IV.F.2. and IV.F.6. are below the ground-water standard as specified under Condition IV.B. at the point of compliance for three (3) consecutive years after the compliance period or corrective action period, whichever is greater, then the Permittee may submit an application for a permit modification pursuant to 40 CFR 270.42 as adopted in 15A NCAC 13A .0109 to establish an alternate groundwater monitoring program.

8. The Permittee shall determine whether there is a statistically significant increase, for each parameter identified in Condition IV.B., over the concentration limit for that parameter each time the concentration of hazardous constituents is monitored in groundwater at the compliance point pursuant to Condition IV.F.2. In determining whether such an increase has occurred, the Permittee must compare the groundwater quality at each monitoring well specified in Condition IV.C. in accordance with the procedures specified in Condition IV.H. When evaluating the monitoring results the Permittee shall use the statistical procedures specified in Section E-5d in the Application, in accordance with 40 CFR 264.97(h)(1) as adopted in 15A NCAC 13A .0109
NOTE: If inspection of the data clearly shows that hazardous constituent levels are above the concentration limits specified in Table IV-I, the Permittee may elect not to perform statistics.

9. If the Permittee chooses to perform a statistical evaluation, the Permittee shall perform the statistical evaluation required by Condition IV.F.8. within sixty (60) days after completion of sampling.

G. CORRECTIVE ACTION PROGRAM

1. The Permittee shall continue corrective action as required by Appendix C and Section E-8 of the Application as stipulated by 40 CFR 264.100(c) as adopted in 15A NCAC 13A .0109. A final remedy has been

selected and implemented for the site. Previous ORC injections, the completed SWMU 14 Interim Measures, and continued groundwater monitoring to document the efficacy and effectiveness of the previously implemented actions constitute the final remedy for Corrective Action for the Site.

2. The Permittee shall conduct a corrective action program to remove or treat in place any hazardous constituents under 40 CFR 264.93 as adopted in 15A NCAC 13A .0109 (Condition IV.B.) that exceed the concentration limit under 40 CFR 264.94 as adopted in 15A NCAC 13A .0109 in groundwater between the compliance point under 40 CFR 264.95 as adopted in 15A NCAC 13A .0109 (Condition IV.C.) and the downgradient facility property line; and beyond the facility boundary as required under 3004(v) of RCRA, as amended, and 40 CFR 264.101(c) as adopted in 15A NCAC 13A .0109, unless the Permittee can demonstrate to the satisfaction of the Department that despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such action, or such action is not necessary to protect public health or the environment.

3. The corrective action program is as described in the plans and specifications in Section E-8 of the Application and as required by 40 CFR 264.100(e) as adopted in 15A NCAC 13A .0109. The equipment used for the corrective action program shall be known as the remedial action system.

4. The influence of the remedial action system shall, at a minimum, extend beyond the boundaries of the plume as identified in Section E-8c of the Application. The remediation action system required under Condition IV.G.3 shall be modified if it does not meet this requirement.

5. The Permittee shall submit data supporting the projected vertical and horizontal influence of the extraction system to the Department within ninety (90) days after the initiation of the corrective action system.

6. The Permittee shall submit a revised post-closure cost estimate as required by Conditions II.H., II.I., II.J and II.K for all additional corrective action and monitoring required by Part IV of this permit and Appendices A, B, and C. The Permittee shall submit this revised cost estimate within thirty (30) days of the remedial action system design final approval.

7. The Permittee shall treat, store, and dispose of all contaminated groundwater in accordance with all applicable federal, state and local laws. At a minimum, the Permittee shall obtain the required NPDES or POTW approval from the appropriate authority.

8. The Permittee shall submit the following items as discussed in Appendix C with respect to the operation and maintenance of the remedial action system, prior to the beginning of the corrective action program:

    a. Personnel Training - The Permittee shall prepare and implement a personnel training plan sufficient to train any personnel associated with the remedial action system.

b. Contingency Plan - The Permittee shall prepare and implement, if necessary, a plan to be followed if there is a release from the remedial action system.

c. Required Equipment - The Permittee shall include in a plan and provide, at all times, the necessary equipment to carry out the required contingency plan. The plan should also include the required testing and maintenance of equipment.

d. Abandonment Plan - The Permittee shall include an abandonment plan for implementation following the completion of corrective action for the remedial action system.

e. Cost Estimates for Abandonment - An estimate of abandoning the remedial action system should be provided for as a portion of the revised post-closure cost estimate required by Condition II.G.

9. The Permittee shall test and maintain the remedial action system as required in Appendix C of this permit.

H. SAMPLING AND ANALYSIS PROCEDURES

The Permittee shall use the following techniques and procedures when obtaining samples and analyzing samples from the groundwater monitoring wells described in Condition IV.E.:

1. Samples shall be collected by the techniques described in the most recently approved groundwater Sampling and Analysis Plan.

2. Samples shall be preserved and shipped (when shipped off-site for analysis) in accordance with the procedures specified in the most recently approved groundwater Sampling and Analysis Plan.

3. Samples shall be analyzed according to the procedures specified in the most recently approved groundwater Sampling and Analysis Plan and any subsequent procedure specified by the Department.

4. Samples shall be tracked and controlled using the chain of custody procedures specified in the most recently approved groundwater Sampling and Analysis Plan.

5. Samples shall be obtained using bailers or pumps and other sampling equipment that will not significantly interfere with the analysis; and,

6. The sampling and analysis plan shall be updated to reflect any changes approved or required by the Department.

I. REPORTING, RECORD KEEPING, AND RESPONSE

1. The Permittee shall enter all monitoring, testing, and analytical data obtained pursuant to Condition IV.H. in the operating record, as required by 40 CFR 264.73(b)(6) as adopted in 15A NCAC 13A .0109.

2. The Permittee must report in writing annually to the Department on the effectiveness of the corrective action program, as required by 40 CFR 264.100(g) as adopted in 15A NCAC 13A .0109. This report

shall also be made part of the operating record and shall include all monitoring, testing, and analytical data obtained under Conditions IV.F., IV.G., and IV.H. This report shall also include proposals for improvements of the corrective action system in order to maintain compliance with Conditions IV.E. and IV.G.

3. The Permittee shall report concentrations of any additional Appendix IX constituents (identified pursuant to Condition IV.F.7. and not listed in Table IV-I) to the Department, and within seven (7) days after completion of analysis, as specified in 40 CFR 264.99(g) as adopted in 15A NCAC 13A .0109.

4. The Permittee shall report concentration levels for constituents identified in Appendix A for wells identified in Appendix A to the Department within sixty (60) days after completion of the groundwater sampling event.

J. PERMIT MODIFICATION

1. If the Permittee determines that the corrective action program, required by this permit, no longer satisfies the requirements of the regulations, an application for a permit modification must be submitted within ninety (90) days to make any appropriate changes to the program, which will satisfy the regulations.

2. The Permittee must request a permit modification as described under Condition IV.F.11. if it is desired to make a change in the groundwater monitoring program following the completion of the necessary requirements.

3. If the Permittee determines that the compliance/corrective action monitoring program, required by this permit, no longer satisfies the requirements of the regulations, an application for a permit modification must be submitted within ninety (90) days to make any appropriate changes to the program, which will satisfy the regulations.

4. The Permittee must request a permit modification to include the extension of the corrective action system following the completion of the actions required under Condition IV.G. and Appendix C of this permit.

K. DUTY OF PERMITTEE

The Permittee must assure that monitoring and corrective action measures necessary to achieve compliance with the groundwater protection standard under 40 CFR 264.92 as adopted in 15A NCAC 13A .0109 are taken during the term of the permit.

L. SPECIAL CONDITIONS

1. The Permittee shall conduct well abandonment in accordance with Title 15 NCAC 2C well construction standards; a certification, which reflects the abandonment procedure, must be submitted.

PART V - CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREAS OF CONCERN (AOCs)

A. APPLICABILITY

The Conditions of this Part apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Appendix D of the permit, which require further investigation.

2. The SWMUs identified in Appendix D which require no further investigation at this time or are addressed under the permit.

3. The SWMUs identified in Appendix D which require confirmatory sampling.

4. Any additional SWMUs or AOCs discovered during the course of ground-water monitoring, field investigations, environmental audits, or other means.

5. Corrective action beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for completion of such off-site action will be required.

B. DEFINITIONS

For purposes of this Part, the following definitions shall be applicable:

1. The term "area of concern" (AOC) includes any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under section 3005 (c)(3) of the Resource Conservation and Recovery Act and 40 CFR 270.32 (b)(2) as adopted in 15A NCAC 13A .0113 in order to insure adequate protection of human health and the environment.

2. A "Corrective Action Management Unit" (CAMU) includes any area within a facility that is designated by the Department under part 264 Subpart S, for the purpose of implementing corrective action requirements under 40 CFR 264.101 as adopted in 15A NCAC 13A .0109 and RCRA section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

3. Corrective Action shall be defined as all activities including activities conducted beyond the facility boundary, that are proposed or implemented to facilitate assessment, monitoring, and active or passive remediation of releases of hazardous waste or hazardous constituents to soil, groundwater, surface water, or the atmosphere associated with Hazardous Waste Management Units (HWMUs), Solid Waste Management Units (SWMUs), and/or Areas of Concern (AOCs) located at the facility or off-site, as required by 40 CFR 264.100 and 264.101 and adopted in 15A NCAC 13A .0109 or as otherwise required and specified by this permit.

4. "Corrective measures" include all corrective action necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any area of concern or solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required under 40 CFR 264.101 as adopted by 15A NCAC 13A .0109. Corrective measures may address releases to air, soils, surface water or ground water.

5. "Extent of contamination" is defined as the horizontal and vertical area in which the concentrations of the hazardous constituents in the environmental media are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

6. "Facility" includes all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g. one or more landfills, surface impoundments, or combination of them). For the purposes of implementing corrective action under 40 CFR 264.101 as adopted in 15A NCAC 13A .0109, a facility includes all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

7. A "hazardous constituent" for the purposes of this part are those substances listed in 40 CFR Part 261 Appendix VIII as adopted in 15A NCAC 13A .0106 or 40 CFR 264 Appendix IX as adopted in 15A NCAC 13A .0109.

8. "Interim Measures" are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented.

9. The term "land disposal" means placement in or on the land except for a CAMU and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

10. "Landfill" includes any disposal facility or part of a facility where waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

11. A "release" for purposes of this part includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents.

12. "Remediation waste" includes all solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under 40 CFR 264.101 as adopted in 15A NCAC 13A .0109 and RCRA section 3008 (h). For a given facility, remediation wastes originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004 (v) or 3008 (h) for releases beyond the facility boundary.

13. The term "solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

14. A "solid waste management unit" (SWMU) for the purposes of this part includes any unit which has been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for management of solid waste. RCRA regulated hazardous waste management units are also solid waste management units. Solid Waste Management Units include areas which have become contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).

15. A "Temporary Unit" (TU) includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Department, such units must conform to specific standards, and may only be in operation for a period of time as specified in this permit.

16. A "unit" for the purposes of this part includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, waste water treatment unit, elementary neutralization unit, transfer station, or recycling unit.

C. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any additional SWMUs as discovered under Condition V.A.4.

2. The Permittee shall notify the Department in writing, within fifteen (15) calendar days of discovery, of any Areas of Concern (AOCs) as discovered under Condition V.A.4. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). If the Department determines that further investigation of an AOC is required, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition V.E.1. or Condition V.F.1.

3. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition V.C.1. At a minimum, the SAR shall provide the following information:

   a. Location of unit(s) on a topographic map of appropriate scale such as required under 40 CFR 270.14(b) (19) as adopted in 15A NCAC 13A .0113.

   b. Designation of type and function of unit(s).

   c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

   d. Dates that the unit(s) was operated.

   e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

   f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include ground-water data, soil analyses, air, and/or surface water data).

4. Based on the results for the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition V.F.1.b.

D. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT PREVIOUSLY IDENTIFIED SWMUs and AOCs

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of ground-water monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Condition V.A.2. or SWMUs or AOCs identified in Condition V.A.4. for which further investigation under Condition V.C.4. was not required.

2. If the Department determines that further investigation of the SWMUs and AOCs is needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition V.F.1.b.

E. CONFIRMATORY SAMPLING (CS)

1. The Permittee shall prepare and submit to the Department, within forty five (45) calendar days of the effective date of permit, or notification by the Department for a newly identified SWMU, a Confirmatory Sampling (CS) Work Plan to determine any release from SWMUs and AOCs identified in V.A.3. and Appendix D. The CS Work Plan shall include schedules of implementation and completion of specific actions necessary to determine a release. It should also address applicable requirements and affected media.

2. The CS Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the CS Work Plan schedule in the letter approving the CS Work Plan. If the Department disapproves the CS Work Plan, the Department shall either (1) notify the Permittee in writing of the CS Work Plan's deficiencies and specify a due date for submission of a revised CS Work Plan, (2) revise the CS Work Plan and notify the Permittee of the revisions, or (3) conditionally approve the CS Work Plan and notify the Permittee of the conditions.

3. The Permittee shall implement the confirmatory sampling in accordance with the approved CS Work Plan.

4. The Permittee shall prepare and submit to the Department in accordance with the approved schedule, a Confirmatory Sampling (CS)Report, within sixty (60) calendar days after approval of the CS Work Plan, identifying those SWMUs and AOCs listed in Condition V.A.3. that have released hazardous waste or hazardous constituents into the environment. The CS Report shall include all data, including raw data, and a summary and analysis of the data, that supports the above determination.

5. Based on the results of the CS Report, the Department shall determine the need for further investigations at the SWMUs and AOCs covered in the CS Report. If the Department determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition V.F.1.b. The Department will notify the Permittee of any "no further action" decision.

F. RCRA FACILITY INVESTIGATION (RFI)

1. RFI Work Plan(s)

a. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of the approval of the Confirmatory Sampling Report, a RCRA Facility Investigation (RFI) Work Plan for those units identified in Condition V.A.1. This Work Plan shall be developed to meet the requirements of Condition V.F.1.c.

b. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of notification by the

Department, an RFI Work Plan for those units identified under Condition V.C.4., Condition V.D.2. or Condition V.E.5. This RFI Work Plan(s) shall be developed to meet the requirements of Condition V.F.1.c.

c. The RFI Work Plan(s) shall meet the requirements of Appendix E at a minimum. The Work Plan(s) shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of releases and the potential pathways of contaminant releases to the air, land, surface water, and ground water. The Permittee must provide sufficient justification and/or documentation that a release is not probable if a unit or a media/pathway associated with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in the RFI Work Plan(s). Such deletions of a unit, media or pathway from the RFI(s) are subject to the approval of the Department. The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Appendix E. Such omissions or deviations are subject to the approval of the Department. The RFI Work Plan may be phased to allow for subsequent investigatory activity to be contingent upon the initial phase finding. If the scope of the Work Plan(s) is designed to be an initial phase, the initial phase must summarize all potential final phase activities needed to meet the requirements of this condition. In addition, the scope of the RFI Work Plan(s) shall include all investigations necessary to ensure compliance with 40 CFR 264.101(c) as adopted in 15A NCAC 13A .0109.

d. The RFI Work Plan(s) must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the RFI Work Plan schedule in the letter approving the RFI Work Plan(s). If the Department disapproves the RFI Work Plan(s), the Department shall either (1) notify the Permittee in writing of the RFI Work Plan's deficiencies and specify a due date for submission of a revised RFI Work Plan, (2) revise the RFI Work Plan and notify the Permittee of the revisions and the start date of the schedule within the approved RFI Work Plan, or (3) conditionally approve the RFI Work Plan and notify the Permittee of the conditions.

2. RFI Implementation

The Permittee shall implement the RFI(s) in accordance with the approved RFI Work Plan(s) and Appendix E. The Permittee shall notify the Department twenty (20) days prior to any sampling activity.

3. RFI Reports

a. If the time required to conduct the RFI(s) is greater than one hundred eighty (180) calendar days, the Permittee shall provide the Department with quarterly RFI Progress Reports (90 day intervals) beginning ninety (90) calendar days from the start

date specified by the Department in the RFI Work Plan approval letter. The Progress Reports shall contain the following information at a minimum:

i. A description of the portion of the RFI completed;

ii. Summaries of finding;

iii. Summaries of any deviations from the approved RFI Work Plan during the reporting period;

iv. Summaries of all contacts with local community public interest groups or State government;

v. Summaries of any problems or potential problems encountered during the reporting period;

vi. Actions taken to rectify problems;

vii. Changes in relevant personnel;

viii. Projected work for the next reporting period.

b. The Permittee shall prepare and submit to the Department Draft and Final RCRA Facility Investigation Report(s) for the investigations conducted pursuant to the Work Plan(s) submitted under Condition V.F.1. The Draft RFI Report(s) shall be submitted to the Department for review in accordance with the schedule in the approved RFI Work Plan(s). The Final RFI Report(s) shall be submitted to the Department within thirty (30) calendar days of receipt of the Department's comments on the Draft RFI Report. The RFI Report(s) shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and extent of contamination at the facility, including sources and migration pathways, and a description of actual or potential receptors. The Report(s) shall also describe the extent of contamination (qualitative/ quantitative) in relation to background levels indicative of the area. If the Draft RFI Report is a summary of the initial phase investigatory work, the report shall include a Work Plan for the final phase investigatory actions required based on the initial findings. Approval of the final phase Work Plan shall be carried out in accordance with Condition V.F.1.d. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study, if necessary.

c. The Department will review the Final RFI Report(s) and notify the Permittee of the need for further investigative action and/or the need for a Corrective Measures Study to meet the requirements of V.H., Appendix G and 40 CFR 264.101 as adopted in 15A NCAC 13A .0109. The Department will notify the Permittee of any "no further action" decision. Any further investigative action required by the Department shall be

prepared and submitted in accordance with a schedule specified by the Department and approved in accordance with Condition V.F.1.d.

G. INTERIM MEASURES (IM)

1. IM Work Plan

a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC which the Department determines is necessary. IM are necessary in order to minimize or prevent the further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in V.G.1.b. Such interim measures may be conducted concurrently with investigations required under the terms of this permit. The Permittee may initiate interim measures by submitting an IM Work Plan for approving implementation with reporting in accordance with the requirements under Condition V.G.

b. The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and to be consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

c. The IM Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. If the Department disapproves the IM Work Plan, the Department shall either (1) notify the Permittee in writing of the IM Work Plan's deficiencies and specify a due date for submission of a revised IM Work Plan, (2) revise the IM Work Plan and notify the Permittee of the revisions and the start date of the schedule within the approved IM Work Plan, or (3) conditionally approve the IM Work Plan and notify the Permittee of the conditions.

2. IM Implementation

a. The Permittee shall implement the interim measures in accordance with the approved IM Work Plan.

b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions, or additions to the IM Work Plan.

c. Final approval of corrective action required under 40 CFR 264.101 as adopted in 15A NCAC 13A .0109 which is achieved through interim measures shall be in accordance with 40 CFR 270.41 as adopted in 15A NCAC 13A .0113 and Condition V.I. as a permit modification.

3. IM Reports

a. If the time required for completion of interim measures is greater than one (1) year, the Permittee shall provide the Department with progress reports at intervals specified in the approved IM Work Plan. The Progress Reports shall contain the following information at a minimum:

i. A description of the portion of the interim measures completed;

ii. Summaries of any deviations from the IM Work Plan during the reporting period;

iii. Summaries of any problems or potential problems encountered during the reporting period;

iv. Projected work for the next reporting period; and

v. Copies of laboratory/monitoring data.

b. The Permittee shall prepare and submit to the Department, within ninety (90) calendar days of completion of interim measures conducted under Condition V.G., an IM Report. The IM Report shall contain the following information at a minimum:

i. A description of interim measures implemented:

ii. Summaries of results;

iii. Summaries of any problems encountered;

iv. Summaries of accomplishments and/or effectiveness of interim measures; and

v. Copies of all relevant laboratory/monitoring data, etc. in accordance with Condition I.D.10.

H. CORRECTIVE MEASURES STUDY

1. Corrective Measures Study (CMS) Work Plan

a. The Permittee shall prepare and submit a CMS Work Plan for those units requiring a CMS within ninety (90) calendar days of notification by the Department that a CMS is required. This CMS Work Plan shall be developed to meet the requirements of Condition V.H.1.b.

b. The CMS Work Plan shall meet the requirements of Appendix G. The CMS Work Plan shall include schedules of implementation and completion of specific actions necessary to complete a CMS. The Permittee must provide sufficient justification and/or documentation for any unit identified in accordance with Condition V.H.1.a. which is deleted from the CMS Work Plan. Such deletion of a unit is subject to the approval of the Department. The CMS shall be conducted in accordance with the approved CMS Work Plan. The Permittee shall provide sufficient written justification for any omissions or deviations from the

minimum requirements of Appendix G. Such omissions or deviations are subject to the approval of the Department. The scope of the CMS Work Plan shall include all investigations necessary to ensure compliance with 3005(c)(3), 40 CFR 264.101, 264.552 as adopted in 15A NCAC 13A .0109, and 270.32(b)(2) as adopted in 15A NCAC 13A .0113. The Permittee shall implement corrective actions beyond the facility boundary as set forth in Condition V.A.5.

c. The Department shall either approve or disapprove, in writing, the CMS plan. If the Department disapproves the CMS Work Plan, the Department shall either (1) notify the Permittee in writing of the CMS Work Plan's deficiencies and specify a due date for submittal of a revised CMS Work Plan, (2) revise the CMS Work Plan and notify the Permittee of the revisions, or (3) conditionally approve the CMS Work Plan and notify the Permittee of the conditions. This modified CMS Work Plan becomes the approved CMS Work Plan.

2. Corrective Measures Study Implementation

The Permittee shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Work Plan, no later than fifteen (15) calendar days after the Permittee has received written approval from the Department for the CMS Work Plan. The CMS shall be conducted in accordance with the approved CMS Work Plan approved in accordance with Condition V.H.1.c.

3. CMS Report

a. The Permittee shall prepare and submit to the Department a draft and final CMS Report for the study conducted pursuant to the approved CMS Work Plan. The draft CMS Report shall be submitted to the Department in accordance with the schedule in the approved CMS Work Plan. The final CMS Report shall be submitted to the Department within thirty (30) calendar days of receipt of the Department's comments on the draft CMS Report. The CMS Report shall summarize any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative If a remedial alternative requires the use of a CAMU, the CMS Report shall include all information necessary to establish and implement the CAMU. The CMS Report shall present all information gathered under the approved CMS Work Plan. The CMS Final Report must contain adequate information to support the Department's decision on the recommended remedy, described under Condition V.I.

b. If the Department determines that the CMS Final Report does not fully satisfy the information requirements specified under Permit Condition V.H.3.a., the Department may disapprove the CMS Final Report. If the Department disapproves the CMS Final Report, the Department shall notify the Permittee in writing of deficiencies in the CMS Final Report and specify a due date for submittal of a revised CMS Final Report. The Department will notify the Permittee of any no further action decision.

c. As specified under Condition V.H.3.a., based on preliminary results and the CMS Final Report, the Department may require

the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

I. REMEDY APPROVAL AND PERMIT MODIFICATION

1. A remedy shall be selected by the Department from the remedial alternatives evaluated in the CMS. The remedy will be based at a minimum on protection of human health and the environment, as per specific site conditions, existing regulations, and guidance.

2. Pursuant to 40 CFR 270.41 as adopted in 15A NCAC 13A .0113, a permit modification will be initiated by the Department upon concurrence of a remedy selected in accordance with Condition V.I.1. This modification will serve to incorporate a final remedy, including a CAMU if necessary, into the permit.

3. Within one hundred and twenty (120) calendar days after this Permit has been modified, the Permittee shall demonstrate financial assurance for completing the approved remedy.

J. MODIFICATION OF THE CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

1. If at any time the Department determines that modification of the Corrective Action Schedule of Compliance is necessary, the Department may initiate a modification to the Schedule of Compliance, Appendix F.

2. Modifications that are initiated and finalized by the Department will be in accordance with the applicable provisions of 40 CFR Part 270 as adopted in 15A NCAC 13A .0113. The Permittee may also request a permit modification in accordance with 40 CFR 270 to change the schedule of compliance.

K. IMMINENT HAZARDS

1. The Permittee shall report to the Department any imminent or existing hazard to public health or the environment from any release of hazardous waste or hazardous constituents. Such information shall be reported orally within 24 hours from such time the Permittee becomes aware of the circumstances. This report shall include the information specified under Condition I.D.15.

2. A written report shall also be provided to the Department within fifteen (15) calendar days of the time the Permittee becomes aware of the circumstances. The written report shall contain the information specified under Condition I.D.15. and; a description of the release and its cause; the period of the release; whether the release has been stopped; and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the release.

L. WORK PLAN AND REPORT REQUIREMENTS

1. All plans and schedules shall be subject to approval by the Department prior to implementation to assure that such work plans and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as specified by the Department.

Upon approval, the Permittee shall implement all plans and schedules as written.

2. All work plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.

3. If the Permittee at any time determines that the SAR information required under Condition V.C., or RFI Work Plan(s) required under Condition V.F., no longer satisfies the requirements of 40 CFR 264.101 as adopted in 15A NCAC 13A .0109 or this permit for prior or continuing releases of hazardous waste or hazardous constituents from solid waste management units and/or areas of concern, the Permittee shall submit an amended RFI Work Plan(s) to the Department within ninety (90) calendar days of such determination.

4. All reports shall be signed and certified in accordance with 40 CFR 270.11 as adopted in 15A NCAC 13A .0113.

5. Two (2) paper copies and one (1) electronic copy of all reports and plans shall be provided by the Permittee to the Department at the following address:

Ms. Julie S. Woosley, Hazardous Waste Section
Hazardous Waste Section
Waste Management Division
1646 Mail Service Center
Raleigh, NC 27699-1646

Electronic reports shall be in MS Word or a common text format. Electronic data shall be in MS Access or a comma delimited format. Data files shall also include a meta data file describing the fields in the data file. Plans shall be electronic to the most reasonable extent possible.

M. SELECTED REMEDY

For the closed former surface impoundment and site-wide groundwater remediation, the selected remedy source removal (completed Interim Measure), ORC (oxygen release compound) application, and monitored natural attenuation.

N. CORRECTIVE MEASURES IMPLEMENTATION REPORT

Within ninety (90) days of Corrective Measures Implementation (CMI), the Permittee shall submit to the Department a CMI Report, including a certification of completion of the corrective measures activities. The CMI Report shall demonstrate compliance with all media clean-up goals. The Department will either approve the Report or request revisions. The final CMI Report shall be submitted to the Department with thirty (30) days of receipt of the Department's comments on the draft Report. Approval by the Department of the Final CMI Report constitutes remedy completion.

O. PROGRESS REPORTS

The Permittee shall provide the Department with annual Corrective Measures Progress Reports beginning one hundred eighty (180) calendar days from the start date. Progress reports shall contain the following information at a minimum:

1. Summaries of compliance with and progress toward achieving cleanup goals;
2. Summaries of deviations from the approved CMI Work Plan, problems or potential problems encountered and actions taken to rectify problems during the reporting period;
3. Projected work for the next reporting period.

PART VI - WASTE MINIMIZATION

A. GENERAL REQUIREMENTS

In the event that the Permittee treats, stores, or disposes of hazardous wastes on-site where such wastes were generated, then the Permittee must comply with 40 CFR 264.73(b)(9) as adopted in 15A NCAC 13A .0109, and Section 3005(h) of RCRA, 42 U.S.C. 6925(h), the Permittee must certify, no less often than annually that:

1. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and

2. The proposed method of treatment, storage or disposal is the most practicable method available to the Permittee which minimizes the present and future threat to human health and the environment.

B. WASTE MINIMIZATION RECORD KEEPING

The Permittee shall maintain copies of the certification in the facility operating record as required by 40 CFR 264.73(b)(9) as adopted in 15A NCAC 13A .0109.

If the Permittee has a Waste Minimization program in place, the program should address the Waste Minimization Program outlined below:

C. WASTE MINIMIZATION PROGRAM OBJECTIVES

The Waste Minimization Program should include the following elements:

1. Top Management Support

a. Dated and signed policy describing management support for waste minimization and for implementation of a waste minimization plan.

b. Description of employee awareness and training programs designed to involve employees in waste minimization planning and implementation to the maximum extent feasible.

c. Description of how a waste minimization plan has been incorporated into management practices so as to ensure ongoing efforts with respect to product design, capital planning, production operations, and maintenance.

2. Characterization of Waste Generation

Identification of types, amounts, and hazardous constituents of waste streams, with the source and date of generation.

3. Periodic Waste Minimization Assessments

a. Identification of all points in a process where materials can be prevented from becoming a waste, or can be recycled.

b. Identification of potential waste reduction and recycling techniques applicable to each waste, with a cost estimate for capital investment and implementation.

c. Description of technically and economically practical waste reduction/recycling options to be implemented, and a planned schedule for implementation.

d. Specific performance goals, preferably quantitative, for the source reduction of waste by stream. Whenever possible, goals should be stated as weight of waste generated per standard unit of production, as defined by the generator.

4. Cost Allocation System

a. Identification of waste management costs for each waste, factoring in liability, transportation, record keeping, personnel, pollution control, treatment, disposal, compliance and oversight costs to the extent feasible.

b. Description of how departments are held accountable for the wastes they generate.

c. Comparison of waste management costs with costs of potential reduction and recycling techniques applicable to each waste.

5. Technology Transfer

Description of efforts to seek and exchange technical information on waste minimization from other parts of the company, other firms, trade associations, technical assistance programs, and professional consultants.

6. Program Evaluation

a. Description of types and amounts of hazardous waste reduced or recycled.

b. Analysis and quantification of progress made relative to each performance goal established and each reduction technique to be implemented.

c. Amendments to waste minimization plan and explanation.

d. Explanation and documentation of reduction efforts completed or in progress before development of the waste minimization plan.

e. Explanation and documentation regarding impediments to hazardous waste reduction specific to the individual facility.

References: "Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program", 54 FR 25056, June 12, 1989.

"Waste Minimization Opportunity Assessment Manual", EPA/625/788/003, July 1988.

PART VII - LAND DISPOSAL RESTRICTIONS

A. GENERAL RESTRICTIONS

40 CFR Part 268 as adopted in 15A NCAC 13A .0112 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage or disposal unit. The Permittee shall maintain compliance with the requirements of 40 CFR 268 as adopted in 15A NCAC 13A .0112. Where the Permittee has applied for an extension, waiver or variance under 40 CFR 268 as adopted in 15A NCAC 13A .0112 the Permittee shall comply with all restrictions on land disposal under this Part once the effective date for the waste has been reached pending final approval of such application.

B. LAND DISPOSAL PROHIBITIONS AND TREATMENT STANDARDS

1. A restricted waste identified in 40 CFR Part 268 Subpart C as adopted in 15A NCAC 13A .0112 may not be placed in a land disposal unit without further treatment unless the requirements of 40 CFR Part 268 Subparts C and/or D as adopted in 15A NCAC 13A .0112 are met.

2. The storage of hazardous wastes restricted from land disposal under 40 CFR Part 268 as adopted in 15A NCAC 13A .0112 is prohibited unless the requirements of 40 CFR 268 Subpart E as adopted in 15A NCAC 13A .0112 are met.

C. DEFINITIONS

For the purposes of 40 CFR Part 268 as adopted in 15A NCAC 13A .0112, "Land Disposal" means placement in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

PART VIII - ORGANIC AIR EMISSIONS REQUIREMENTS FOR PROCESS VENTS AND EQUIPMENT LEAKS

A. GENERAL INTRODUCTION

In the June 21, 1990, Federal Register, EPA published the final rule for Phase I Organic Air Emission Standards (40 CFR Parts 264 and 265, Subparts AA and BB) for hazardous waste treatment, storage, and disposal facilities. Subpart AA contains emission standards for process vents associated with distillation fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste with an annual average total organic concentration of at least ten (10) parts per million (ppm) by weight. SUBPART AA DOES NOT APPLY TO AIR STRIPPING OPERATIONS USED FOR CORRECTIVE ACTION PURPOSES. Subpart BB contains emission standards that address leaks from specific equipment (i.e. pumps, valves, compressors, etc.) that contains or contacts hazardous waste that has an organic concentration of at least ten (10) percent by weight.

B. ORGANIC AIR EMISSION STANDARDS

The Permittee has no units at the present time to which the Organic Air Emissions Requirements of 40 CFR 264, Subpart AA (for process vents), and/or Subpart BB (for equipment leaks) as adopted in 15A NCAC 13A .0113 applies. If the Permittee should change, modify or otherwise identify any unit that is or has become subject to these regulations, the Permittee is required to comply with all 40 CFR 264 as adopted in 15A NCAC 13A .0109, Subpart AA and Subpart BB regulations and is required to submit all 40 CFR 270.24 and 270.25 as adopted in 15A NCAC 13A .0113 informational requirements within thirty (30) calendar days after implementation of the unit's modification.

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APPENDIX A

GROUND WATER SAMPLING AND ANALYSIS

APPENDIX A

GROUND WATER SAMPLING AND ANALYSIS

ANNUAL COMPLIANCE AND CORRECTIVE ACTION EFFECTIVENESS SAMPLING REQUIREMENTS

Monitoring Wells MW-09, MW-10, MW-21, MW-22, MW-23, MW-24, MW-25, MW-31, MW-32, MW-34, MW-35, and MW-36 shall be sampled annually and analyzed for the parameters listed below to evaluate corrective action effectiveness.

Monitoring Well POC-1 shall be the point of compliance well, and shall be sampled annually for the parameters listed below.

PARAMETER	METHOD*
Acetone (voc)	8260B
2-Butanone (VOC)	8260B
Benzene (VOC)	8260B
Chlorobenzene (VOC)	8260B
Ethyl benzene (VOC)	8260B
2-Hexanone (VOC)	8260B
4-Methyl 1-2-Pentanone (MIBK)	8260B
Toluene (VOC)	8260B
Xylenes (total) (VOC)	8260B
Benzoic Acid (SVOC0	8270C
Benzyl Alcohol (SVOC)	8270C
1, 2 Dichlorobenzene (SVOC)	8270C
2-Methy Phenol (o-cresol)	8270C
4-Methyl phenol (p-cresol)	8270C
Naphthalene (SVOC)	8270C
N-nitrosopiperidine (SVOC)	8270C
Phenol (SVOC)	8270C
Vinyl Chloride (VOC)	8260B
Dissolved Oxygen (DO)	Field Measurement
pH	Field Measurement
Conductivity	Field Measurement
Water level	Field Measurement

APPENDIX IX SAMPLING REQUIREMENTS

Monitoring well POC-1 shall be sampled and analyzed for Appendix IX constituents every five years, in addition to the parameters listed above.

Appendix IX Analysis: Use method specified in 40 CFR 264, Appendix IX, codified 15A NCAC 13A .0109.

Note: All methods without prefix are from SW 846 Test Methods for Evaluated Solid Waste, 3rd Edition, available from the Government Printing Office, Washington, DC, as publication number 055-002-81001-2.

Note: All standard methods are from Standard Methods for the Examination of Waste and Wastewater, 15th Edition, prepared and published jointly by the American Public Health Association, American Water Works Association, Water Pollution Control Federation.

* Listed method should be used or equivalent.

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APPENDIX B

MONITORING WELLS

APPENDIX B

PERMANENT EXISITING MONITORING WELLS

1. The Permittee shall maintain the point of compliance monitoring wells listed in Appendix A at the locations specified in Attachment E-1 of the Permit Application. The table below lists all the permanent monitoring wells at the facility and the hydrogeologic zone associated with:

Well ID	***Hydrogeologic Unit screened***	***Purpose of well***
MW-06	Upper Zone	Plume Delineation
MW-07	Upper Zone	Plume Delineation
MW-08	Deep Zone	Deep Zone Plume Delineation
MW-09	Upper Zone	Effectiveness Monitoring
MW-10	Deep Zone	Deep Zone Effectiveness Monitoring
MW-12	Upper Zone	Plume Delineation
MW-13	Deep Zone	Deep Zone Plume Delineation
MW-17	Upper Zone	Plume Delineation
MW-18	Upper Zone	Plume Delineation
MW-19	Upper Zone	Plume Delineation
MW-20	Upper Zone	Plume Delineation
MW-21	Upper Zone	Effectiveness Monitoring
MW-22	Upper Zone	Effectiveness Monitoring
MW-23	Upper Zone	Effectiveness Monitoring
MW-24	Upper Zone	Monitoring well
MW-25	Upper Zone	Effectiveness Monitoring
MW-26	Deep Zone	Deep Zone Plume Delineation
MW-27	Upper Zone	Plume Delineation
MW-31	Upper Zone	Effectiveness Monitoring
MW-32	Deep Zone	Deep Zone Effectiveness Monitoring
MW-33	Upper Zone	Plume Delineation
MW-34	Upper Zone	Effectiveness Monitoring
MW-35	Upper Zone	Effectiveness Monitoring
MW-36	Upper Zone	Effectiveness Monitoring
POC-01	Upper Zone	Point of Compliance

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APPENDIX C

CORRECTIVE ACTION PROGRAM DESIGN OF REMEDIAL ACTION SYSTEM

APPENDIX C

CORRECTIVE ACTION PROGRAM DESIGN OF REMEDIAL ACTION SYSTEM

The Permittee shall submit corrective action construction design plans and data, blueprints and a construction schedule for the remedial action system including recovery wells, pumps, piping, tanks, stripping towers and all associated equipment within ninety (90) days after the effective date of the permit. Construction shall be complete within 180 days of design approval by all applicable parties including the North Carolina Hazardous Waste Section and the North Carolina Division of Water Quality. The remedial action system design plans shall also include the following items:

Locations of the extraction and designated observation wells;

Specifications (pumping rates, diameter, screened intervals, etc.) of the extraction wells;

Projected horizontal and vertical influence of the ground-water extraction system, and all calculations used to make these projections.

INSPECTIONS

The Permittee shall submit a general inspection schedule as required by 264.15(b) with the remedial action system design plans within ninety (90) days after the effective date of the permit.

GENERAL INSPECTION REQUIREMENTS

A description of the inspection schedule for the following equipment must be provided.

1. Monitoring equipment
2. Emergency and safety equipment
3. Operating and structural equipment
4. Communication or alarm systems and decontamination equipment

The schedule must identify the types of problems to look for during inspections (e.g., leaks, deterioration, missing items or materials, inoperative equipment, etc.).

FREQUENCY OF INSPECTIONS

A description of the frequency of inspections must be provided for items on the schedule. The following items shall be inspected weekly:
1. Monitoring equipment.
2. Emergency and safety equipment.
3. Operating and structural equipment.
4. Communication or alarm systems and decontamination equipment.

The remedial action system shall be inspected daily for leaks, spills, proper operation and structural integrity.

REMEDIAL ACTION SYSTEM MAINTENANCE

The Permittee shall submit a maintenance schedule for the remedial action system within thirty (30) days of remedial action system design final approval. Procedures and frequency of maintenance shall be included.

REPORTING REQUIREMENTS

The following outlines the items required under Condition V.I. during the start-up phase of the remedial action system. Upon initiation of the corrective action program, and one (1) month thereafter, the Permittee shall provide ground-water level data from the designated observation wells as required for a standard pump test. This data, along with the pumping rates, shall be used to demonstrate the effectiveness of the ground-water extraction system during the start-up phase. Also include on/off frequencies for cyclic pumping and influences that may result from pumping. This data shall be included in the operating record and the semi-annual report on the effectiveness of the corrective action system.

PERSONNEL TRAINING

The Permittee shall conduct introductory and continuing personnel training programs for each employee involved with ground-water sampling or the remedial action equipment. The training shall include instruction for emergency response, contingency plan implementation and explicit sampling, operation and maintenance procedures. The Permittee shall maintain training documents and records. An outline of the training programs shall be submitted to this office within thirty (30) days of final remedial action system design approval.

CONTINGENCY PLAN FOR REMEDIAL ACTION SYSTEM

The Permittee shall have a contingency plan for the remedial action system for response to spills, bursting or clogging of pipes, failure of equipment, or any other unplanned sudden or non-sudden release of hazardous waste constituents to air, soil or surface water at the facility. A contingency plan shall be submitted to this office within thirty (30) days of final remedial action system design approval.

ABANDONMENT

The Permittee shall submit an abandonment plan for the remedial action system within thirty (30) days of final remedial action system design approval. The Permittee shall at a minimum abandon the remedial action system in a manner that:

a. Minimizes the need for further maintenance, and
b. Minimizes or eliminates, to the extent necessary to prevent threats to human health or the environment, post-closure escape of hazardous waste, and hazardous constituents.

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APPENDIX D

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN SUMMARY

APPENDIX D

SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN SUMMARY

List of Solid Waste Management Units and Areas of Concern that require no further action (NFA) at this time:

SWMU/AOC Number	Description
SWMU 1	WASTE STORAGE AREA
SWMU 2	FLOOR SWEEPING DUMPSTER
SWMU 3	WASTE OIL ACCUMULATION AREA
SWMU 4	OUTSIDE WASTE OIL TANK
SWMU 5	WASTE WATER STORAGE AREA
SWMU 6	CONCRETE FILLED SUMP
SWMU 7	DISTILLATION UNIT
SWMU 8	FLOOR DRAIN (2)
SWMU 10 - 13	PRESS # 1, 2, 3 AND 5 WASTE DRUMS
SWMU 15	INCINERATOR
SWMU 16	ABANDONED UST FARM
SWMU 17	OLD PUMP ROOM
SWMU 18	METAL PAN
SWMU 20	SCRAP METAL DUMPSTER
SWMU 21	NORTH DRAINAGE DITCH
SWMU 22	HAZARDOUS WASTE STORAGE AREA
SWMU 23	WASTEWATER STORAGE AREA
AOC A	PRODUCT STORAGE AREA
AOC B	OUTSIDE SOLVENT PUMP AREA

List of Solid Waste Management Units and Areas of Concern regulated by the RCRA Permit (under corrective action):

SWMU/AOC Number	Description
SWMU 14	FORMER SOLVENT TANK FARM AREA

List of Solid Waste Management Units and Areas of Concern that are in Corrective Action:

SWMU/AOC Number	Description	Description of Remediation Method
SWMU 14	FORMER SOLVENT TANK FARM AREA	SWMU soil was completely excavated and disposed of. Enhanced natural attenuation and Groundwater monitoring.

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APPENDIX E

RCRA FACILITY INVESTIGATION (RFI) WORK PLAN OUTLINE

APPENDIX E

RCRA FACILITY INVESTIGATION (RFI) WORK PLAN OUTLINE

I. RFI Work Plan REQUIREMENTS

The Permittee shall prepare a RCRA Facility Investigation (RFI) Work Plan that meets the requirements of Part V of this document and the RFI Guidance, EPA-530/SW-89-031. This Work Plan shall also include the development of the following plans, which shall be prepared concurrently:

A. Project Management Plan

Permittee shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Sampling and Analysis Plan(s)

The Permittee shall prepare a plan to document all monitoring procedures: field sampling, sampling procedures and sample analysis performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents, so as to ensure that all information and data are valid and properly documented. The Sampling Strategy and Procedures shall be in accordance with Characterization of Hazardous Waste Sites A Methods Manual: Volume II., Available Sampling Methods, EPA-600/4-84-076, or EPA Region IV Engineering Compliance Branch's Standard Operating Procedure and Quality Assurance Manual (SOP). Any deviations from these references must be requested by the applicant and approved by the Department. The Sampling and Analysis Plan must specifically discuss the following unless the EPA-600/4-84-076 or SOP procedures are specifically referenced.

1. Sampling Strategy

a. Selecting appropriate sampling locations, depths, etc.;

b. Obtaining all necessary ancillary data;

c. Determining conditions under which sampling should be conducted;

d. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, subsurface gas);

e. Determining which parameters are to be measured and where;

f. Selecting the frequency of sampling and length of sampling period;

g. Selecting the types of samples (e.g., composites vs. grabs) and number of samples to be collected.

2. Sampling Procedures

a. Documenting field sampling operations and procedures, including;

i. Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, preservatives, and absorbing reagents);

ii. Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii. Documentation of specific sample preservation method;

iv. Calibration of field instruments;

v. Submission of field-biased blanks, where appropriate;

vi. Potential interferences present at the facility;

vii. Construction materials and techniques, associated with monitoring wells and piezometers;

viii. Field equipment listing and sampling containers;

ix. Sampling order; and

x. Decontamination procedures.

b. Selecting appropriate sample containers;

c. Sampling preservation; and

d. Chain-of-custody, including:

i. Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

ii. Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Sample Analysis

Sample analysis shall be conducted in accordance with SW-846: "Test Methods for Evaluating Solid Waste-Physical/Chemical Methods" (third edition). The sample analysis section of the Sampling and Analysis Plan shall specify the following:

a. Chain-of-custody procedures, including:

   i. Identification of a responsible party to act as sampling custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipments, and verify the data entered onto the sample custody records;

   ii. Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

   iii. Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage;

c. Sample preparation methods;

d. Analytical procedures, including:

   i. Scope and application of the procedure;

   ii. Sample matrix;

   iii. Potential interferences;

   iv. Precision and accuracy of the methodology; and

   v. Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

   i. Method blank(s);

   ii. Laboratory control sample(s);

   iii. Calibration check sample(s);

   iv. Replicate sample(s);

   v. Matrix-spiked sample(s);

   vi. Control charts;

vii. Surrogate samples;

viii. Zero and span gases; and

ix. Reagent quality control checks.

h. Preventative maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measures; and
f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis, as appropriate;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth-plots, cross-sectional plots or transits, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and area where more data are required;

c. Display geographical extent of contamination;

d. Illustrate changes in concentration in relation to distances from the source, time, depth or other parameters; and

e. Indicate features affecting inter-media transport and show potential receptors.

II. RCRA FACILITY INVESTIGATION (RFI) REQUIREMENTS

RCRA Facility Investigation:

The Permittee shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of release of hazardous constituents (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical content and quality to support the development and evaluation of the corrective action plan if necessary. The information contained in a RCRA Part B permit application and/or RCRA section 3019 Exposure Information Report may be referenced as appropriate, but must be summarized in both the RFI Work Plan and RFI Report.

All sampling and analyses shall be conducted in accordance with the Sampling and Analysis Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Permittee shall collect information to supplement and/or verify Part B information on the environmental setting at the facility. The Permittee shall characterize the following as they relate to identified sources, pathways and areas of releases of hazardous constituents from Solid Waste Management Units.

1. Hydrogeology

The Permittee shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility, including:

i. Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii. Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii. Depositional history;

iv. Regional and facility specific ground-water flow patterns; and

v. Identification and characterization of areas and amounts of recharge and discharge.

b. An analysis of any topographic features that might influence the ground-water flow system.

c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

i. Hydraulic conductivity and porosity (total and effective);

ii. Lithology, grain size, sorting, degree of cementation;

iii. An interpretation of hydraulic interconnections between saturated zones; and

iv. The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).

d. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i. Water-level contour and/or potentiometric maps;

ii. Hydrologic cross-sections showing vertical gradients;

iii. The flow system, including the vertical and horizontal components of flow; and

iv. Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

e. A description of man-made influences that may affect the hydrology of the site, identifying:

i. Local water-supply and production wells with an approximate schedule of pumping; and

ii. Man-made hydraulic structures (pipelines, trench drains, ditches, etc.)

2. Soils

The Permittee shall conduct a program to characterize the soil and rock units above the water table in the vicinity of contaminant release(s). Such characterization may include, but not be limited to, the following types of information as appropriate:

a. Surface soil distribution;
b. Soil profile, including ASTM classification of soil;
c Transepts of soil stratigraphy;
d. Hydraulic conductivity (saturated and unsaturated);
e. Relative permeability;
f. Bulk density;
g. Porosity;
h. Soil sorption capacity;
i. Cation exchange capacity (CEC);
j. Soil organic content;
k. Soil pH;
l. Particle size distribution;
m. Depth of water table;
n. Moisture content;
o. Effect of stratification on unsaturated flow;
p. Infiltration;
q. Evapotranspiration;
r. Storage capacity;
s. Vertical flow rate; and
t. Mineral content.

3. Surface Water and Sediment

The Permittee shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterizations may include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i. For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii. For impoundments: location, elevation, surface area, depth, volume, freeboard, and construction and purpose;

iii. For streams, ditches, and channels: location, elevation, flow, velocity, depth, width,

seasonal fluctuations, flooding tendencies (i.e., 100 year event), discharge point(s), and general contents.

iv. Drainage patterns; and

v. Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i. Deposition area;

ii. Thickness profile; and

iii. Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Permittee shall provide information characterizing the climate in the vicinity of the facility. Such information may include, but not be limited to:

a. A description of the following parameter:

i. Annual and monthly rainfall averages;

ii. Monthly temperature averages and extremes;

iii. Wind speed and direction;

iv. Relative humidity/dew point;

v. Atmospheric pressure;

vi. Evaporation data;

vii. Development of inversions; and

viii. Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence (i.e., Hurricanes).

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

i. Ridges, hills or mountain area;

ii. Canyons or valleys;

iii. Surface water bodies (e.g., rivers, lakes, bays, etc.); and

iv. Buildings.

B. Source Characterization

For those sources from which releases of hazardous constituents have been detected the Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, to the degree that is possible without undue safety risks, including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineering barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics

a. Location of unit/disposal area;
b. Type of unit/disposal area;
c. Design features;
d. Operating practices (past and present);
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and
h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of wastes placed in the unit;

i. Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);

ii. Quantity; and

iii. Chemical composition.

b. Physical and chemical characteristics such as;

i. Physical form (solid, liquid, gas);

ii. Physical description (e.g., powder, oily sludge);

iii. Temperature;

iv. pH;

v. General chemical class (e.g., acid, base, solvent);

vi. Molecular weight;

vii. Density;

viii. Boiling point;

ix. Viscosity;

x. Solubility in water;

xi. Cohesiveness of the waste; and

xii. Vapor pressure.

c. Migration and dispersal characteristics of the waste such as:

i. Sorption capability;

ii. Biodegradability, bioconcentration, biotransformation;

iii. Photodegradation rates;

iv. Hydrolysis rates; and

v. Chemical transformations.

The Permittee shall document the procedures used in making the above determinations.

C. Characterization of Releases of Hazardous Constituents

The Permittee shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility in accordance with the sampling and analysis plan as required above. These data shall be sufficient to define the extent, origin, direction, and rate of movement of contamination. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Permittee shall address the following types of contamination at the facility:

1. Ground-Water Contamination

The Permittee shall conduct a ground-water investigation to characterize any plumes of contamination detected at the facility. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent of any plume(s) of hazardous constituents originating from or within the facility;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of hazardous constituents in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

The Permittee shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units above the saturated zone in the vicinity of any contaminant release. The investigation may include the following information:

a. A description of the vertical and horizontal extent of contamination;

b. A description of appropriate contaminant and soil chemical properties within the contaminant source area and plume. This may include contaminant solubility, speciation, absorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;

c. Specific contaminant concentrations;

d. The velocity and direction of contaminant movement; and

e. An extrapolation of future contaminant movement.

The Permittee shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from releases of hazardous constituents at the facility. The investigation may include, but not be limited to the following information:

a. A description of the horizontal and vertical extent of any plume(s) originating from the facility, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

4. Air Contamination

The Permittee shall conduct an investigation to characterize gaseous releases of hazardous constituents into the atmosphere or any structures or buildings. This investigation may provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

The Permittee shall document the procedures used in making the above determinations.

D. Potential Receptors

The Permittee shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples and/or data on observable effects in ecosystems may also be obtained as appropriate. The following characteristics shall be identified:

1. Current local uses and planned future uses of ground water:

a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

b. Location of ground-water users, to include withdrawal and discharge wells, within one mile of the impacted area.

The above information should also indicate the aquifer or hydrogeologic unit used and/or impacted for each item.

2. Current local uses and planned future uses of surface waters directly impacted by the facility:

a. Domestic and municipal (e.g., potable and lawn/gardening watering);
b. Recreational (e.g., swimming, fishing);
c. Agricultural;
d. Industrial; and
e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:

a. Recreation;
b. Hunting;
c. Residential;
d. Commercial; and
e. Relationship between population locations and prevailing wind direction.

4. A general description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A general description of the ecology within the area adjacent to the facility.

6. A general demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.

7. A description of any known or documented endangered or threatened species near the facility.

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APPENDIX F

CORRECTIVE MEASURES STUDY PLAN OUTLINE (CMS)

I. Identification and Development of the Corrective Measure Alternatives

A. Description of Current Situation
B. Establishment of Corrective Action Objectives
C. Screening of Corrective Measures Technologies
D. Identification of the Corrective Measure Alternatives

II. Evaluation of the Corrective Measure Alternatives

A. Technical/Environmental/Human Health/Institutional
B. Cost Estimate

III. Justification and Recommendation of the Corrective Measure or Measures

A. Technical
B. Environmental
C. Human Health

IV. Reports

A. Draft
B. Final
C. Public Review and Final Selection of Corrective Measure

I. IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE MEASURES ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified potential corrective measure technologies, the Permittee shall identify, screen and develop the alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Permittee shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation (RFI) Report. The Permittee shall provide an update to information presented in the RFI regarding previous response activities and interim measures which have been or are being implemented at the facility. The Permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Permittee shall propose facility-specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground-

water releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR 264.100 as adopted in 15A NCAC 13A .0109.

C. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFI and assess the technologies which are applicable at the facility. The Permittee shall screen the corrective measure technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site).

3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. Identification of the Corrective Measure Alternatives

The Permittee shall develop the Corrective Measure Alternatives based on the corrective action objectives and analysis of potential corrective measure technologies. The Permittee shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternatives. The alternatives developed should represent a

workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies.

II. EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVES

The Permittee shall describe each corrective measure alternative that passes through the initial screening and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Permittee shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

1. Technical;

a. The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

i. Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii. Useful life is defined as the length of time the level of desired effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Permittee shall provide information on the reliability of each corrective measure including their

operation and maintenance requirements and their demonstrated reliability:

i. Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii. Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Permittee shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

i. Constructability is determined by conditions both internal and external to the facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ii. Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. The Permittee shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental;

The Permittee shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; and adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health;

The Permittee shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the concentrations and characteristics of the contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time for management of mitigation measures, the relative levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional

The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative. If the selected remedy is capping and closure in place, a notation must be made in the land deed.

B. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

   a. Direct capital costs include:

      i. Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.

      ii. Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;

iii. Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

iv. Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i. Engineering expenses: Cost of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii. Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii. Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

iv. Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accident insurance; real estate taxes on purchased land or right-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

III. JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Permittee shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. The Department will select the corrective measure alternative or alternatives to be implemented based on the results obtained from work completed under Section II and III. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proved effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure(s) must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure(s) posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

IV. REPORTS

The Permittee shall prepare a Corrective Measure Study Report presenting the results obtained from Sections I through III and recommending a corrective measure alternative. Copies of the preliminary report shall be provided by the Permittee to the Department for review and approval.

A. Draft

The Report shall at a minimum include:

1. A description of the facility;

   a. Site topographic map and preliminary layouts.

2. A summary of the corrective measure(s) and rationale for selection;

   a. Description of the corrective measure(s) and rationale for selection;

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements; and

   e. Long-term monitoring requirements.

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;

   a. Field studies (ground water, surface water, soil, air); and

   b. Laboratory studies (bench scale, pick scale).

4. Design and Implementation Precautions;

   a. Special technical problems;

   b. Additional engineering data required;

   c. Permits and regulatory requirements;

   d. Access, easements, right-of-way;

   e. Health and safety requirements; and

   f. Community relations activities.

5. Cost Estimates and Schedules;

   a. Capital cost estimate;

   b. Operation and maintenance cost estimate; and

   c. Project schedule design, construction, and operation.

Copies of the draft shall be provided by the Permittee to the Department.

B. Final

The Permittee shall finalize the Corrective Measure Study Report incorporating comments received from the Department on the Draft Corrective Measure Study Report. The report shall become final upon approval by the Department.

C. Public Review and Final Selection of Corrective Measures

Upon receipt of the Final Corrective Measure Study Report, the Department shall announce its availability to the public for review and comment. At the end of the comment period, the Department shall review the comments and then inform the Permittee of the final decision as to the approved Corrective Measures to be implemented.

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APPENDIX G

SCHEDULE OF COMPLIANCE

APPENDIX G

SCHEDULE OF COMPLIANCE

Schedule of Compliance	Due Date
Notification of Newly Identified SWMUs and AOCs Condition V.C.1. and Condition V.C.2.	Within fifteen (15) calendar days of discovery
SWMU Assessment Report Condition V.C.3.	Within ninety (90) calendar days of notification
Notification for Newly Discovered Releases at Previously Identified SWMUs and AOCs Condition V.D.1.	Within fifteen (15) calendar days after discovery
Confirmatory Sampling Work Plan for SWMUs identified in Appendix D, Condition V.E.1.	Within forty five (45) calendar days after notification by the Department.
Confirmatory Sampling Report Condition V.E.4.	In accordance with the approved CS Work Plan
RFI Work Plan for SWMU(s) Identified in Appendix D Condition V.F.1.a.	Within ninety (90) calendar days after notification by the Department.
RFI Work Plan for SWMU(s) and AOC(s) under Condition V.C.4., Condition V.D.2., Condition V.E.5., and Condition V.F.1.b.	Within ninety (90) calendar days after receipt of notification by the Department which SWMUs or AOCs require an RFI
RFI Progress Reports Condition V.F.3.a.	Quarterly, beginning ninety (90) calendar days from the start date specified by the Department *
Draft RFI Report Condition V.F.3.b.	In accordance with the approved RFI Work Plan
Final RFI Report Condition V.F.3.b.	Within thirty (30) calendar days after receipt of the Department's comments on the Draft RFI Report
Interim Measures Work Plan Condition V.G.1.a.	Within thirty (30) calendar days of notification by the Department
Interim Measures Progress Reports Condition V.G.3.a.	In accordance with the approved IM Work Plan **
Interim Measure Report Condition V.G.3.b.	Within ninety (90) calendar days of completion of interim measures
CMS Work Plan Condition V.H.1.a.	Within ninety (90) calendar days of notification by the Department that a CMS is required
Implementation of CMS Work Plan Condition V.H.2.	Within fifteen (15) calendar days after receipt of Department's approval of plan
Draft CMS Report Condition V.H.D.	In accordance with the approved CMS Work Plan
Final CMS Report Condition V.H.3.a.	Within thirty (30) calendar days of the Department's comments on draft CMS Report

Schedule of Compliance	Due Date
Demonstration of Financial Insurance Condition V.I.3.	Within one hundred and twenty (120) calendar days after permit modification for remedy
Imminent Hazard Report Condition V.K.1. and V.K.2.	Oral within 24 hours; written within fifteen (15) calendar days of the time the Permittee becomes aware of the circumstances
Waste Minimization Certification Condition VI.	If Condition VI.A. is applicable, annually from the effective date of permit
Organic Air Emissions Report Condition VIII.	Within thirty (30) calendar days after implementation of the unit's modification that renders Subpart AA and/or Subpart BB applicable
Groundwater monitoring Condition IV.F and IV.H	The Permittee will perform groundwater monitoring in accordance with the most recently approved Sampling and Analysis Plan. Monitoring and Effectiveness Reports shall be submitted within sixty (60) days of receipt of analytical results.

The above reports must be signed and certified in accordance with 40 CFR 270.11 as adopted by 15A NCAC 13A .0113.

* This applies to Work Plan execution that requires more than one hundred and eighty (180) calendar days.

** This applies to Work Plan execution that requires more than one year.

FACILITY NAME *Former International Paper Folding Carton Facility*
EPA ID # *NCD 072 022 726*

PERMIT MODIFICATION LOG SHEET

MODIFCATION DATE	SUBJECT	PAGES
10/19/2010	Replaced Temporary wells GB-1 through GB-4 with permanent monitoring Wells MW-35- and MW-36	Appendix A, Appendix B Permit Page IV-2
10/19/2010	Clarification and change in Groundwater protection standards: Remove COD and Delta BHC from Table IV and Appendix A Remove Dissolved Oxygen (DO) from Table IV, Keep DO in Appendix A	 Permit Page IV-1, Appendix A Permit Page IV-1, Appendix A
10/19/2010	Update RCRA Subtitle C site ID Form to reflect change in operator status	Part A of Application
10/19/2010	Revised Groundwater Sampling & Analysis Plan	Section E-5b of Permit Application
4/14/14	Reduced sampling frequency from semi-annual to annual	Replaced Modules E, F, and I of permit application
4/14/14	Revised Groundwater Sampling & Analysis Plan	Standalone document dated March 2014
4/14/14	Updated name of Section Chief	Permit Cover Sheet

PERMIT MODIFICATION LOG SHEET

MODIFCATION DATE	SUBJECT	PAGES
4/14/14	Indicated that sampling protocols are described in most recently approved SAP	Permit Section I.D.10
4/14/14	Removed reference to SAP	Permit Section I.F.3
4/14/14	Changed semi-annual to annual	Permit Section I.H.1
4/14/14	Revised text to include "the most recently approved SAP"	Permit Section II.E.1
4/14/14	Deleted m&p xylenes and o-xylenes from list of analytes	Permit Section IV-I
4/14/14	Indicated POC-1 would be monitored as per the SAP	Permit Section IV.E.1.a
4/14/14	Added MW-10 to the list of wells monitored annually	Permit Section IV.E.1.b
4/14/14	Deleted bullet regarding sampling MW-10 on an annual basis	Permit Section IV.E.1.c
4/14/14	Deleted bullet regarding sampling POC-1 every five years	Permit Section IV.E.1.d

4/14/14	Referenced "the most recently approved SAP"	Permit Section IV.F.2 Permit Section IV.F.3
4/14/14	Referenced "the most recently approved SAP"	Permit Section IV.H.1 Permit Section IV.H.2 Permit Section IV.H.3 Permit Section IV.H.4
4/14/14	Updated name of Section Chief	Permit Section L.5
4/14/14	Changed "semi-annual" to "annual"	Appendix A first section
4/14/14	Added MW-10 to the list of wells monitored annually	Appendix A first paragraph
4/14/14	Deleted text regarding sampling MW-10 on an annual basis	Appendix A second section
4/14/14	Deleted m&p xylenes, o-xylenes, and temperate from analyte list	Appendix A parameter list
4/14/14	Referenced "the most recently approved SAP"	Appendix B.1

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April 14 2014

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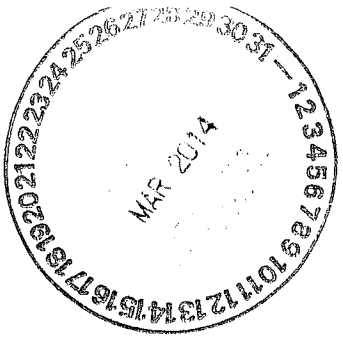


MODULE F PROCEDURES TO PREVENT HAZARDS

F-1 Security

F-1a Security Procedures and Equipment

SWMU 14 is located entirely within a fenced portion of the facility. The surrounding fence line is approximately 6 feet high and manufactured from metal chain links. Access to the enclosed area is controlled through four lockable gates. SWMU 14's location near the plant building is easily observed by plant personnel. During hours of darkness, the area is illuminated by floodlights.

F-1a(1) 24-Hour Surveillance System

SWMU 14 does not actively accept or dispose of waste. A 24-hour surveillance system is only required for the active part of a facility. This section does not apply.

F-1a(2) Barrier and Means to Control Entry

F-1a(2)(a) Barrier

SWMU 14 is entirely enclosed by chain link fence. Access to SWMU 14 by the general public is prevented by this fence.

F-1a(2)(b) Means to Control Entry

Entry into the SWMU 14 would only be allowed by facility personnel. All visitors to the fenced in area must pass through facility gates maintained by facility personnel.

F-1a(3) Warning Signs

SWMU 14 does not actively accept or dispose of waste. Warning signs are only required for the active part of a facility. This section does not apply.

F-1b Waiver

There is no request for a waiver from the security requirements. Therefore, this section does not apply.

F-2 Inspection Schedule

F-2a General Inspection Requirements

Inspections of the WMU and groundwater monitoring network are conducted in accordance with Section 4.0 of the Post Closure Plan (Radian, March 1998), which is presented in the **CD accompanying this application.**

F-2a(1) Types of Problems

Regular inspections are performed to provide an early warning of developing problems that could impact the WMU's integrity, such as cover subsidence, slope failure, or deterioration of the drainage system. Inspection of the groundwater monitoring system is performed to assure that wells have not sustained damage. WMU and groundwater monitoring system inspections are conducted using the checklists shown in **Figures F-1 and F-2**, respectively.

F-2a(2) Frequency of Inspection

Inspection of the WMU and the groundwater monitoring system are conducted on an annual basis in conjunction with scheduled groundwater monitoring events.

F-2b Facility Inspection Requirements

F-2b(1) Monitoring Equipment

There is no monitoring equipment associated with SWMU 14. This section does not apply.

F-2b(2) Emergency Equipment

No emergency equipment is required for SWMU 14. This section does not apply.

F-2b(3) Safety Equipment

No safety equipment is required for SWMU 14. This section does not apply.

F-2b(4) Security Equipment

During WMU inspections, the fence and gates are inspected for damage that may impact security to SWMU 14. Locks, protective casings, and caps are visually inspected on an annual basis during the evaluation of the groundwater monitoring system.

F-2b(5) Operating and Structural Equipment

There is no operating and structural equipment associated with SWMU 14. This section does not apply.

F-2b(6) Testing of Equipment

There is no equipment requiring testing at SWMU 14. This section does not apply.

F-2c Specific Process Inspection Requirements

F-2c(1) Container Inspection

SWMU 14 does not have containers holding hazardous waste. This section does not apply.

F-2c(2) Tank System Inspection

SWMU 14 does not have tanks holding hazardous waste. This section does not apply.

F-2c(3) Waste Pile Inspection

SWMU 14 is not a waste pile. This section does not apply.

F-2c(4) Surface Impoundment Inspection

SWMU 14 is not a surface impoundment. This section does not apply.

F-2c(5) Incinerator Inspection

SWMU 14 is not an incinerator. This section does not apply.

F-2c(6) Landfill Inspection

While SWMU 14 has been closed as a landfill, the SWMU was never designed or used as an operating disposal facility. Rather, the waste consists only of soil containing spill residue associated with former tank farm operations. There is no liner or leachate collection system associated with SWMU 14, or are there run-on/run-off controls, wind dispersal control systems, or leak detection systems. This section does not apply.

F-2c(7) Land Treatment Inspection

SWMU 14 is not a land treatment unit. This section does not apply.

F-2c(8) Miscellaneous Unit Inspections

SWMU 14 is not a miscellaneous unit. This section does not apply.

F-2c(9) Boilers and Industrial Furnaces Inspections

SWMU 14 is not a boiler or industrial furnace. This section does not apply.

F-2c(10) Drip Pad Inspections

SWMU 14 is not a drip pad. This section does not apply.

F-2c(11) Containment Building Inspections

SWMU 14 is not a containment building. This section does not apply.

F-2c(12) Subpart AA - Air Emission Standards for Process Vents

This section does not apply. SWMU 14 does not perform distillation, fractionation, thin-film evaporation, solvent extraction, air stripping or steam stripping to manage hazardous waste.

F-2c(13) Subpart BB - Air Emission Standards for Equipment Leaks

This section does not apply.

Subpart BB establishes air emission controls for equipment leaks. Subpart applies to equipment that contains or contacts hazardous waste with total organic carbon (TOC) of at least 10 percent by weight. Types of equipment subject to Subpart BB include:

- Pumps,
- Compressors,
- Pressure relief devices,
- Sampling connection systems,
- Valves,
- Open-ended lines,
- Flanges, or
- Other connectors.

SWMU-14 does not use any of the equipment listed in Subpart BB.

F-2c(14) Subpart CC - Air Emission Standards for Tanks, Surface Impoundments, and Containers

This section does not apply. SWMU 14 does not treat, store or dispose of hazardous waste in tanks, surface impoundments or containers.

F-2d Remedial Action

SWMU 14 does not anticipate the need for remedial action. SMWU-14 does not actively accept, treat, or dispose of waste.

F-2e Inspection Log

Copies of completed inspection checklists (Figure F-1) are maintained at the facility.

F-3 Waiver of Preparedness and Prevention Requirements

SWMU 14 does not actively accept, treat, or dispose of waste. SWMU-14 has been closed by installing a multi-media cap. The SWMU does not present any hazards to facility personnel or the general public. Therefore, the equipment and communication requirements in Section F-3 do not apply.

F-3a Equipment Requirements

This section does not apply.

F-3a(1) Internal Communications

This section does not apply.

F-3a(2) External Communications

This section does not apply.

F-3a(3) Emergency Equipment

This section does not apply.

F-3a(4) Water for Fire Control

This section does not apply.

F-3b **Aisle Space Requirements**

This section does not apply.

F-4 **Preventive Procedures, Structures, and Equipment**

SWMU 14 does not actively accept, treat, or dispose of waste. Procedures addressing loading and unloading operations do not apply. No equipment is necessary for operation of the closed SWMU.

F-4a **Loading and Unloading Operations**

This section does not apply.

F-4b **Run-Off**

This section does not apply.

F-4c **Water Supplies**

This section does not apply.

F-4d **Equipment and Power Failure**

This section does not apply.

F-4e **Personal Protection Equipment**

This section does not apply.

F-4f **Ventilation Equipment**

This section does not apply.

F-5 **Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes**

F-5a **Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes**

SWMU 14 was generated as the result of a spill of MEK onto the soil. SWMU 14 does not actively accept, treat or dispose of any hazardous waste. Precautions to prevent ignition or reaction of ignitable or reactive wastes are not applicable.

F-5b General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

This section does not apply. SWMU 14 does not have ignitable or reactive wastes.

F-5c Management of Ignitable or Reactive Wastes in Containers

This section does not apply. SWMU 14 does not have wastes in containers.

F-5d Management of Incompatible Wastes in Containers

This section does not apply. SWMU 14 does not have wastes in containers.

F-5e Management of Ignitable or Reactive Wastes in Tanks

This section does not apply. SWMU 14 does not have wastes in tanks.

F-5f Incompatible Wastes in Tanks

This section does not apply. SWMU 14 does not have wastes in tanks.

F-5g Ignitable or Reactive Wastes in Waste Piles

This section does not apply. SWMU 14 does not have wastes in waste piles.

F-5h Incompatible Wastes in Waste Piles

This section does not apply. SWMU 14 does not have waste in waste piles.

F-5i Ignitable or Reactive Wastes in Surface Impoundments

This section does not apply. SWMU 14 does not have wastes in surface impoundments.

F-5j Incompatible Wastes in Surface Impoundments

This section does not apply. SWMU 14 does not have wastes in surface impoundments.

F-5k Ignitable or Reactive Wastes in Landfills

This section does not apply. SWMU 14 does not have ignitable or reactive wastes.

F-5l **Incompatible Wastes in Landfills**

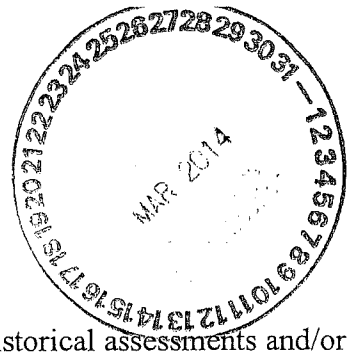
This section does not apply. SWMU 14 does not have incompatible wastes.

F-5m **Ignitable or Reactive Wastes in Land Treatment**

This section does not apply. SWMU 14 is not a land treatment unit.

F-5n **Incompatible Wastes in Land Treatment**

This section does not apply. SWMU 14 is not a land treatment unit.



MODULE E GROUNDWATER MONITORING

E-1 Interim Status Monitoring Data

This section presents available groundwater data collected through historical assessments and/or as part of the semi-annual post-closure groundwater monitoring program in effect at the time of this submittal. Monitoring activities followed approved sampling and analysis plans, and groundwater quality assessment plans.

Drilling and well construction information and aquifer testing data is provided in the January 2006 *RFI Report* which is included electronically on the **attached CD**. Additional monitoring well information and construction details are summarized on **Table E-1-1**. Laboratory analytical results on a well by well basis are included as **Tables E-1-2** through **E-1-24**. A historical summary of field measurement results such as dissolved oxygen, conductivity and pH is included as **Table E-1-25**. **Table E-1-26** presents historical groundwater elevation data.

E-1a Description of Wells

As shown in **Figure E-1-1,** there are 27 existing wells at the site. Wells POC-1, MW-9, MW-10, MW-21, MW-23, MW-25, MW-31, and MW-34 comprise the groundwater monitoring network and are monitored regularly. The remaining nineteen wells are located on or adjacent to the site and have been monitored, as necessary, in conjunction with the site's groundwater quality assessment. Of these, well MW-12 serves as the upgradient well in the surficial aquifer, and MW-13 is the upgradient well in the underlying hydrogeologic unit. Twenty-three of the 27 wells are completed in the surficial aquifer. Four wells, MW-10, MW-13, MW-26, and MW-32 are completed in the underlying hydrogeologic unit. The wells provide information on background water quality, types and concentrations of contaminants, and the direction and rate of groundwater flow.

Nineteen shallow wells and well MW-13 were drilled using 6.25-inch or 8-inch outside diameter hollow-stem auger to a depth equivalent to the top of the limestone cap rock (approximately 17 feet). A 2-inch diameter, flush-jointed, Schedule 40 PVC casing and a manufactured 5 or 10-foot length of 10-slot (0.010 inch) screen was inserted through the hollow-stem auger to the bottom of each borehole. At each borehole, the augers were slowly withdrawn, as clean, well-sorted medium sand was placed in the annular space to a height approximately 2 feet above the top of the screen. Screen length was selected to expose nearly all the saturated thickness of the uppermost aquifer for sample collection. At least 2 feet of pelletized bentonite was placed above the sand pack and then hydrated to cause the bentonite to swell. A bentonite/cement grout was tremied into the annular space to the land surface. Four feet of protective steel casing (or, a

flush-mounted manhole assembly, in the case of MW-27) was set into the grout to protect the wellhead.

The GB series wells (GB-01 through GB-04) were installed with direct-push technology to a total depth of 9 feet below ground surface (bgs). A 1-inch diameter, flush-jointed, Schedule 40 PVC casing and a manufactured 5-foot length of 10-slot (0.010 inch) screen was installed within each borehole. At each borehole, a well-sorted, medium sand filter was placed in the annular space to a height approximately 2 feet above the top of the screened interval. At least 2 feet of pelletized bentonite was placed above the sand pack and then hydrated, causing the bentonite to swell. A bentonite/cement grout was tremied into the annular space to ground surface.

Wells MW-26 and MW-32 were completed in the lower unit in the same manner as described above, except that each well was installed through a 6-inch PVC outer casing to isolate the surficial aquifer from the lower unit. Well MW-l0 was installed using a rotary bit and is completed in the lower unit as an open-hole well. It is isolated from the surficial aquifer by a 4-inch galvanized casing that is grouted in-place.

Upon completion, all wells were developed by surging and bailing or over pumping. **Table E-l-1** provides additional monitoring well details including well depths, screened intervals, and top of casing (measuring point) elevations. Well construction records, boring logs, and well diagrams are included in the January 2006 *RFI Report*, included electronically on the **attached CD**.

E-1b Description of Sampling/Analysis Procedures

Site monitoring activities, including assessment monitoring and post-closure monitoring, have been conducted following approved Sampling and Analysis Plans. These plans describe sample collection, sample preservation, analytical procedures, and chain of custody control and meet the requirements of 40 CFR 265.92.

E-1c Monitoring Data

Tables summarizing electronically available historical laboratory results and field measurements collected at the site to date are included as **Tables E-1-2** through **E-1-25**. No initial background mean and variance were calculated because a release of hazardous constituents requiring a Groundwater Assessment Plan has already been documented.

E-1d Statistical Procedures

Not applicable. No statistical calculations of indicator parameters were necessary since monitoring began in the assessment phase.

E-1e Groundwater Assessment Plan

Groundwater quality assessment activities have been conducted at the site since 1989. All of the activities have been conducted following approved Groundwater Quality Assessment Plans and the results have been submitted in the Groundwater Quality Assessment Reports. Additional assessment information has been submitted in letter reports.

Results of groundwater assessment activities are presented in **Section E-2**, General Hydrogeologic Information; **Section E-3**, Topographic Map Requirements; and **Section E-4**, Contaminant Plume Description.

E-2 General Hydrogeologic Information

This section presents a discussion of regional and local hydrogeology.

E-2a Regional Geology

The Cretaceous Black Creek and Peedee Formations unconformably overlie the crystalline basement rock and consist of approximately 1000 feet of interbedded sands, silts, and clays, many of which are dense and well indurated. Bain (1970) reports that the Peedee contains four water-bearing sand units, with only the uppermost sand containing fresh water. The uppermost sand is a calcareous cemented quartz sand reported to be about 35 feet thick. Bain (1970) describes the upper sand as being overlain, in most areas, by a clay bed that ranges from a few feet to more than 50 feet in thickness, depending upon location.

Overlying the Peedee Formation is the Castle Hayne Limestone of Tertiary age. According to LeGrand and Brown (1955), the Castle Hayne is reported to be of middle to late Eocene age. Bain (1970) reports that in some locations Tertiary sediments older than the Castle Hayne are present; however, no such early Tertiary deposits are present in the area. The lack of early Tertiary deposits is attributed to the positive effects of the Cape Fear Arch (Bain, 1970), which produced a period of erosion or non-deposition prior to the late Eocene. As a result, the Castle Hayne Limestone unconformably overlies the channeled and eroded upper surface of the Peedee Formation (Bain, 1970).

Bain (1970) describes four separate facies that can be part of the Castle Hayne, although the thickness and distribution of these facies varies markedly with location. The four facies are 1) a basal sandy shell conglomerate containing reworked material from the Peedee Formation, 2) a glauconite shell limestone, 3) a dense, chalk-white, siliceous limestone locally known as "cap rock," and 4) a cream to light green, glauconite-bearing reworked shell hash. Not all of these facies are present in every location, and the total thickness of the Castle Hayne can range from 0-

150 feet within New Hanover County. In general, the Castle Hayne thins to the northwest in New Hanover County disappearing near the Cape Fear River.

Overlying the Castle Hayne Limestone are unconsolidated sedimentary deposits of varying ages. Bain (1970) reports some late Tertiary clays and sands in eastern New Hanover County, but indicates that the deposits in the vicinity of Wilmington are of Pleistocene age. These Pleistocene deposits consist of interbedded fine to medium-grained sands and clays that are normally tan to grey-white in color.

Major structural features are generally absent from the late Cretaceous and younger sequences on the coastal plain. In the vicinity of New Hanover County, the Cape Fear Arch, a broad uplift feature that roughly parallels the Cape Fear River, has affected deposition and regional structural trends. Bain (1970) reports that one of the sand units within the Peedee Formation has a strike of N25°E and a dip to the southeast at a rate of 10 feet per mile. Aside from the regional effects of the Cape Fear Arch no other major structural features are known to exist in the area.

E-2b Site-Specific Geology

This section discusses local stratigraphy and structure. Figure 3 of the 2006 RFI (see attached CD) presents a typical stratigraphic section for the site. Figures 3 and 4 of the RFI (attached) present geologic cross-sections of the site.

E-2b(1) Stratigraphy

Sediments belonging to the Peedee Formation, Castle Hayne Limestone, and undifferentiated surficial deposits are present. This sequence is consistent with regional conditions described by Bain (1970); however, unit thickness and character show noticeable variation within the site.

E-2b(1)(a) Peedee Formation

A total of five borings were advanced into the Peedee Formation at the site. These borings were those associated with the deep monitoring wells, MW-10, MW-13, MW-26, and MW-32, and a deep geologic boring, SB-1, installed at or near the location of monitoring well MW-8. Only the top 10 to 20 feet of Peedee Formation were penetrated in these borings, but the stratigraphic conditions encountered at these locations are consistent throughout the site. The sequence of the Peedee Formation investigated at the site is a mixture of medium to well-indurated sandstone and dense, stiff clay. The sandstone is medium to fine-grained quartz sand with calcareous cement and is hard enough to resist standard penetration sampling. Blow counts in excess of 100 were recorded for the sandstone in some locations. Sieve analysis of a sample collected from a depth of 30 to 31.5 feet in monitoring well MW-26 indicates the material to be 72% fine sand with

about 28% clay (Table E-2-1). The material is dense, gray to brown clay that also resists drive sampling. Both units are solid enough to permit open hole completion of wells drilled into them. Thickness and distribution of these units within the site are variable. Unlike the unit described by Bain, the sandstone rarely exceeds 10 feet in thickness, and the sequence appears to be interbedded, containing thin stringers of sand and clay.

E-2b(1)(b) Castle Hayne limestone

As mentioned previously, Bain (1970) described four facies of the Castle Hayne Limestone; however, because of the erosional nature of the contact between it and adjacent units, distribution of most of the facies is irregular. In the vicinity of the Federal Paper Board site, the Castle Hayne is very thin and close to thinning out completely. The facies found to be present most consistently is the siliceous limestone "cap rock" that is 2 to 3 feet thick, and was encountered at all boring locations at the site. Lag deposits of shell hash on top of the "cap rock" and of reworked Peedee Formation underneath the limestone are present in some locations. These deposits appear to be channel filling deposits and are not laterally extensive. Thickness of the Castle Hayne Limestone ranges from 10 to 12 feet at the east end of the property to less than 5 feet to the west.

E-2b(1)(c) Surficial Deposits

Surficial deposits are resting unconformably on the Castle Hayne Limestone. These consist of medium to fine-grained, uncemented quartz sand deposits, which contain a highly variable amount of clay. The interbedded clay lenses range from 1 to 4 feet in thickness and are randomly distributed. Subsurface data suggest that clay and other fine-grained material may constitute a high percentage of the surficial deposits near the waste unit. Total thickness of the surficial deposits varies from 10 to 20 feet throughout the site.

During construction of monitoring wells, selected Shelby tube samples were collected for determination of total porosity. Results of the determination are presented in **Table E-2-1** and indicate a range of total porosity values from 34% to 45%. Sediments are primarily fine sand with varying amounts of silt and clay, depending upon location. A total porosity value of 40% appears to be an average for the surficial sediments. Effective porosity based on grain size distribution is estimated at 17%.

E-2b(2) Structure

Consistent with regional conditions, units of the Peedee Formation and Castle Hayne Limestone show a slight southeastward dip. Site-specific data (Figures 3 and 4 of the 2006 RFI) support the thinning of the Castle Hayne Limestone to the northwest and the data suggest that the west end

of the Federal Paper Board site is very near to a point where the Castle Hayne disappears entirely. While some lithologic and stratigraphic variability is noticeable, this variation appears to be the result of erosion rather than structural deformation. No evidence of folds, faults, or similar structures has been found at the site.

E-2c Hydrogeology

Bain (1970) reports that units in the area containing fresh water extensive enough to be considered aquifers are surficial deposits, the Castle Hayne Limestone, and the uppermost sandstone of the Peedee Formation. While these three sequences may be important aquifer systems in parts of the county, the minimal thickness of the Castle Hayne Limestone at this site limits its significance as a water source. As a result, two aquifer systems are recognized and discussed. The upper aquifer system consists of all saturated sediments above the Castle Hayne "cap rock," and the lower system consists of that portion of the Peedee Formation investigated at this site. Discussion of the Castle Hayne Limestone is included because of its importance as an aquitard rather than an aquifer at this location.

E-2c(1) Upper Aquifer System

The porous nature of the surficial deposits makes them an obvious source of a water supply in many areas of the county. Well yields from this system vary; however, Bain (1970) reports yields as high as 1000 gpm have been obtained from wells in the northwest part of New Hanover County where the sequence is coarser grained. The shallow depth of the aquifer and its porous nature also make the sequence readily susceptible to surface contamination. As a result, the surficial deposits are seldom used as a drinking water source in areas of high population density or where there is industrial activity. Within the city limits of Wilmington and in nearby areas, wells normally tap aquifers below those associated with the surficial deposits. In these areas, some shallow wells are installed in the surficial deposits for lawn watering and other nonconsumptive uses.

At the site, considerable data on nature and hydrologic properties of the surficial sediments have been collected. These data include water level elevations for all on-site wells, results from three pumping tests performed at different locations on site, and results of laboratory determinations of aquifer properties from undisturbed samples collected during well construction.

E-2c(2) Castle Hayne Limestone

Beneath the surficial deposits lies the Castle Hayne Limestone. Bain (1970) reports that in areas where the limestone is of sufficient thickness, it is a significant aquifer and source of drinking water. In the site vicinity, however, the limited thickness of the unit appears to preclude it from

being an aquifer. Throughout the site, the Castle Hayne Limestone is represented by a thin (2 to 3 feet) siliceous limestone "cap rock" that does not have significant quantities of water associated with it. In fact, drilling data indicate the "cap rock" lacks significant permeability, and it appears to act in concert with fine-grained sediment beneath it as an effective aquitard. Course-grained fossil hash deposits lying on top of the cap rock can have high hydraulic conductivity, but these are included as part of the upper aquifer system because of the direct interconnection between these deposits and the sands which overlie them.

E-2c(3) Lower Aquifer System

Beneath the Castle Hayne Limestone is the sedimentary sequence of the Peedee Formation. Bain (1970) describes an upper calcareous cemented sand unit as a significant aquifer in New Hanover County. He indicates the unit is about 35 feet thick and that wells drilled into the unit are normally finished without screen or casing. Bain (1970) reports specific capacities for this aquifer range from 1 to 75 gpm per foot of drawdown. Whether or not this aquifer is present at the Federal Paper Board site is uncertain. Drilling logs indicate that a calcareous cemented sand is present beneath the Castle Hayne Limestone and monitoring well MW-10 was completed open hole in this zone. However, the drilling data indicates the cemented sand to be less than 10 feet thick, and yield from all wells that penetrate sequence below the Castle Hayne is very low. Attempts to pump water continuously from the deep wells were unsuccessful, as each could be pumped dry almost immediately. The instantaneous withdrawal test done in monitoring well MW-26 produced a hydraulic conductivity value of 0.01 feet/day and exhibited very slow recovery during the test.

All of the data collected from below the Castle Hayne Limestone indicates that an aquifer, as reported by Bain, is not present within the top 20 feet of the Peedee Formation at the site. Some lithologic similarity exists between sediments present at the site and those described by Bain. However, sediments at the site appear to contain a greater amount of fine-grained material and have low hydraulic conductivities.

E-2c(4) Groundwater Flow Direction and Hydraulic Gradient

Water level data has been collected from on-site wells during historical assessment and current groundwater monitoring activities. The water levels are measured to the nearest 0.01 foot from a measuring point, with an elevation known to the nearest 0.01 foot. **Figures E-2-1** and **E-2-2** illustrate shallow and lower confined unit groundwater elevation contour maps as measured during the October 2006 groundwater monitoring event. The figures indicate that groundwater in each unit is primarily in a western direction. Those measurements illustrated on **Figures E-2-1** and **E-2-2** are consistent with historical groundwater elevation measurements at

the site. Consistent with surface topography, the water level data shows a flat hydraulic gradient in the area of the plant building that becomes steeper to the west. Spacing between individual contour lines varies with location indicating the presence of changes in hydraulic conductivity or aquifer thickness that produce differences in hydraulic gradient. Hydraulic gradient measurements were completed along three flow paths in the surficial water bearing unit. The flow paths are illustrated on **Figure E-2-1** as A-A', B-B', and C-C'. The hydraulic gradients of each flow path, based on October 2006 water table data, are 0.007 ft/ft, 0.01 ft/ft, and 0.01 ft/ft, respectively.

Groundwater elevations measured in shallow and deep well pairs indicate that the potential hydraulic gradient between the upper and lower water-bearing zones is in the downward direction.

E-2c(5) Hydraulic Conductivity

Estimates of hydraulic conductivity were obtained from pumping tests, instantaneous withdrawal (slug) tests, and laboratory tests performed on undisturbed samples. In 1988, a two-hour pumping test was run on monitoring well MW12 and produced a hydraulic conductivity of about 0.6 ft/day. No observation wells were available for these test and all drawdown measurements were made in the pumped well.

During the week of June 26 to 30, 1989, two pumping tests were run in a recovery well field west of the former tank farm. Data from each test was evaluated using time-drawdown and distance-drawdown methods. Calculated transmissivities are summarized in **Table E-2-2**. Values of hydraulic conductivity determined from the pumping tests are presented in **Table E-2-3** along with values obtained from slug tests and from laboratory measurements. The values of pumping test #1 indicate a relatively high transmissivity near the pumping well decreasing with western, downgradient movement (toward R-39). The decrease is likely a result of thinning of the aquifer, and a decrease in hydraulic conductivity of aquifer material near well R-39. Evaluation of results from pumping test #1 indicates that materials in the vicinity of the pumping well have hydraulic conductivity values on the order of 35 to 50 ft/day, and are probably coarse-grained channel deposits of limited lateral extent. Response from downgradient observation well R-39 suggests that the hydraulic conductivity in the downgradient direction is significantly less as the aquifer becomes shallower and more fine-grained.

A second pumping test was performed on the recovery well field and drawdown measurements were obtained from three observation wells for this test. Values of transmissivity were considerably lower than those determined from pumping test #1, ranging from 97 to 110

feet2/day. Transmissivity values calculated from all three observation wells are similar and yield an estimate of hydraulic conductivity of about 10 feet/day.

Data from the instantaneous withdrawal (slug) tests exhibit some variation, but, in general, yielded values of hydraulic conductivity near those obtained from pumping test #2. Slug test values ranged from 0.2 feet/day to 6 feet/day. This variation is likely a combined result of differences in test geometry and changes in aquifer properties. Laboratory conductivity values are significantly less.

E-2c(6) Ground Water Velocity

Groundwater velocity, V_{gw}, in the shallow water-bearing zone beneath the facility was estimated using the following equation:

$$V_{gw} = Ki/n$$

where:

K = hydraulic conductivity [ft/day]
i = hydraulic gradient (change of groundwater elevation/distance) [ft/ft]
n = effective porosity [percent/100].

A hydraulic conductivity of the shallow water-bearing zone beneath the facility was assumed as 10 ft/day, based on the results of the slug tests and pumping tests described earlier. Average groundwater seepage velocities in the shallow water-bearing zone were estimated using this value, an estimated effective porosity of 17%, and hydraulic gradients of 0.007 ft/ft. 0.01 ft/ft, and 0.01 ft/ft along the three flow paths (A-A', B-B', C-C') described in Section E-2c(4). Flow path A-A', representing groundwater flow beneath the facility building, resulted in an estimated groundwater velocity of 0.4 ft/day and a travel time of 5.0 years across the flow path. The flow path B-B' represents groundwater flow to the southwest downgradient of SWMU 14. The calculated groundwater velocity for B-B' was 0.6 ft/day, resulting in an estimated travel time of 1.7 years across the flow path. Flow in a west-northwest direction downgradient of SWMU 14 toward MW-23 is represented by flow path C-C'. An estimated groundwater velocity of 0.6 ft/day and an estimated travel time of 1.4 years across the flow path was determined.

Based on available data in this unit (i.e. groundwater elevations, flow direction, geology, and gradient), groundwater velocities in the lower confined unit are similar to those in the shallow water bearing unit.

E-3 Topographic Map Requirements

Figure A-1 presents a USGS map of the site and surrounding areas. **Figure B-1** presents a topographical map of the facility. Information regarding groundwater flow rate and direction;

boundaries of the uppermost aquifer; and underlying interconnection between the uppermost aquifer and lower aquifer were discussed in previous sections and are illustrated on other figures.

E-4 Contaminant Plume Description

The lateral and vertical extent of groundwater contamination at the site was been fully delineated and tracked during assessment activities and semi-annual groundwater monitoring events. The extent of benzene in groundwater at the site serves as the best indication of the total extent of impacted groundwater as it is the most widely distributed analyte.

Data obtained during the October 2006 groundwater monitoring event indicated benzene concentrations in excess of the NC 2L standard of 1 microgram per Liter (μg/L) in seven of the fifteen monitoring wells sampled. **Table E-4-1** presents a summary of key analytes detected during the October 2006 event. Benzene concentrations were the greatest at temporary well GB-03 at 21 μg/L. In addition to benzene, only vinyl chloride exceeded the respective NC 2L standard of 0.015 μg/L in the four one-inch diameter monitoring wells (GB-series). Toluene exceeded the NC 2L standard of 1,000 μg/L at GB-01 and POC-01.

Figure E-4-1 illustrates the lateral distribution of benzene using data from the October 2006 monitoring event. Analytical data from deeply screened monitoring wells indicates the distribution of contaminants are limited to the surficial aquifer, and supports the conclusions that the limestone cap rock and underlying deposits function as an effective confining layer.

The highest VOC concentrations were centered on GB-01, with NC 2L standard exceedances for benzene (14 μg/L), toluene (9,300 μg/L), and vinyl chloride (2.6 μg/L). Benzene concentrations decreased with downgradient movement to GB-04, then slightly increased, westward, through GB-02 and GB-03.

In the October 2006 sampling, vinyl chloride was detected in POC-01, temporary wells GB-01, GB-02, GB-03, and GB-04, and monitoring wells MW-09 and MW-24. The vinyl chloride plume appears to coincide with the benzene plume at the site.

Historical and recent analytical data indicates that the groundwater data from the GB-series wells delineated a narrow contaminant plume, with the majority of the contaminant mass currently situated along a flow path from POC-01 to MW-23 (**Figure E-4-1**). These results indicate that constituents of concern at concentrations above the NC 2L standards are still limited to a relatively small area downgradient to the west from the former above-ground storage tank (AST) farm at the facility, with the majority of the mass centered on GB-01.

Monitoring well POC-1 serves as the point of compliance due to its proximity to the former AST farm and representative nature of constituents detected in samples from this area. POC-1 is sampled for Appendix IX analyses every five years. **Table E-4-2** summarizes the results of Appendix IX analysis for the most recent (April 2006) groundwater sample collected from this well.

Table E-4-3 presents a historical summary of the maximum concentrations at which each analyte was detected at the site.

E-5 General Monitoring Program Requirements

The general monitoring program requirements are incorporated in several parts of this application as identified below:

E-5a Description of Wells

See Section 3.0 of the most recently approved Sampling and Analysis Plan for Corrective Action and Compliance Monitoring. **Table E-1-1** presents additional monitoring well construction details.

E-5b Description of Sampling/Analysis Procedures

See Section 4.0 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-5c Procedures for Establishing Background Quality

Monitoring well MW-12 serves as an upgradient, background monitoring point for the site. Historical analytical data obtained from this well will be reviewed in order to establish background water quality

E-5d Statistical Procedures

See subparts E-7a(6)(f) and E-8d(3)(c) of this application.

E-6 Description of Detection Monitoring Program for Facilities not Detecting the Presence of Hazardous Constituents

This section is not applicable, as hazardous constituents have been detected.

E-7 Compliance Monitoring Program for Facilities Which Have Detected Presence of Hazardous Constituents

Information regarding the proposed monitoring program is included in the following subsections.

E-7a Description of Monitoring Program

E-7a(1) Description of Wastes Previously Handled at Facility

Refer to Section 2.2.2 of the 2006 *RFI Report* for information regarding waste management at the site. The *RFI Report* is included electronically on the **attached CD**.

E-7a(2) Characterization of Contaminated Groundwater

See subpart E-4 of this application.

E-7a(3) List of Hazardous Constituents to be Monitored in Compliance Program

The constituents proposed for monitoring consist of the volatile and semi volatile organic constituents listed in **Table E-7-1.** The list is based upon Table IV-1 in the current permit. Constituents on this list that have not been detected above NCAC 2L standards (or the groundwater protection standards in Table IV-1 if an NCAC 2L standard does not exist) over the past three years have been dropped from this list. Pursuant to condition IV.F.6 of the permit, vinyl chloride has been added to this list, consistent with the June 2005 confirmation of this constituent in POC-1.

Among the constituents that have been dropped from the list are MEK and acetone, which were once chief constituents of concern at the site, but have not been detected above the NCAC 2L standard at the site since the October 1999 monitoring event. In fact these constituents have gone largely undetected throughout the plume over the past several years.

Also not included on the list are 4-methyl-2- pentanone (MIBK) and benzyl alcohol. Although no NCAC 2L standard exists for these constituents, they were not detected at the site above their respective permit groundwater protection standards since 1998.

Constituents removed from the list will continue to be monitored at POC-1 during the Appendix IX monitoring event performed every five years and may be returned to the list if a confirmed detection above NCAC 2L standards occurs.

E-7a(4) Proposed Concentration Limits for Each Constituent

Table E-7-2 lists proposed limits for constituents to be compliance monitored. Proposed concentration limits are based on either health-based Class GA groundwater standards codified in 15 NCAC 2L.0202 (NCAC 2Ls) or risk-based EPA Region 9 Preliminary Remediation Goals (PRGs) for tap water. The standards represent the maximum allowable concentrations of constituents which may be tolerated without creating a threat to human health or which would otherwise render the groundwater unsuitable for its intended best usage. The NCAC 2L

groundwater quality standards for the constituents have been established as the lesser of the following criteria:

- Systemic threshold concentration calculated as follows: [Reference Dose (mg/kg/day) x 70 kg (adult body weight) x Relative Source Contribution (0.10 for inorganics; 0.20 for organics)]/[2 liters/day (avg. water consumption)];
- Concentration which corresponds to an incremental lifetime cancer risk of 1 x 10-6;
- Taste threshold limit value;
- Odor threshold limit value;
- Maximum contaminant level; or
- National secondary drinking water standard.

EPA Region 9 PRGs are only used for analytes in which no NCAC 2L standard is established.

E-7a(5) Detailed Plans of an Engineering Report Describing Groundwater Monitoring System

See Section 3.0 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-7a(6) Description of Proposed Sampling and Statistical Analysis Procedures for Groundwater Data

E-7a(6)(a) Compliance Period

The compliance period is currently in effect and will continue until the groundwater protection standards have not been exceeded at the point-of-compliance (monitoring well POC-1) for a period of one year.

E-7a(6)(b) Sampling and Analysis Procedure

See Section 4.8 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-7a(6)(c) Sampling Frequency

See Section 4.8 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-7a(6)(d) Procedures for Annual Determination of Uppermost Aquifer Flow Rate and Direction

Water-level monitoring will be performed as described in Section 4.2 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring. The resulting water-level elevation data from each annual sampling event will be plotted on a site map, drawn to scale, and contoured to interpret groundwater flow direction. The gradient measured from the contour map will be incorporated into a modified version of Darcy's law using previously established values of hydraulic conductivity and effective porosity to calculate average flow velocity.

E-7a(6)(e) Annual Testing Procedures for Appendix IX Constituents

See Section 4.8 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-7a(6)(f) Procedures for Determining a Statistically Significant Increase for any Monitored Parameters

Not applicable.

E-7a(7) Procedures to be Implemented if Groundwater Protection Standard is Exceeded at Compliance Point Monitoring Well

Existing data indicate that the Groundwater Protection Standard will be exceeded at the point of compliance monitoring well. A groundwater corrective action program is discussed in **Section E-8.**

E-7b An Engineering Feasibility Plan for Corrective Action Program

A corrective action program to address exceedances of the Groundwater Protection standard has been implemented. See Section 4.0 of the 2000 *Corrective Action Plan* as well as the 2002 *ORC® Re-application Plan for Groundwater Corrective Action*, each of which are included electronically on the **attached CD**.

At the time of application submittal, IP and NCDENR are in the process of evaluating alternative remedial approaches for the site.

E-8 Corrective Action Program

E-8a Characterization of Contamination

See subpart E-4 of this application.

E-8b Concentration Limits

See subpart E-4 and **Table E-4-3** of this application.

E-8b(1) Concentration Limits Established Under 264.94(a)

See subpart E-7a(4) and **Table E-7-2** of this application.

E-8b(2) Alternate Concentration Limits

Not applicable.

E-8c Corrective Action Plan

A final remedy has been selected and implemented for the site. Previous ORC injections, the recently completed SWMU 14 Interim Measures, and continued groundwater monitoring to document the efficacy and effectiveness of the previously implemented actions constitute the final remedy for Corrective Action for the Site.

E-8d Groundwater Monitoring Program

E-8d(1) Description of Monitoring System

E-8d(1)(a) Description of Wells

See Section 3.0 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring. **Table E-1-1** presents additional monitoring well construction details.

E-8d(1)(b) Description of How the Groundwater Monitoring Program will Demonstrate the Adequacy of the Corrective Action

Because the impact from the release from the WMU is readily apparent, the monitoring data will be evaluated utilizing a descriptive presentation of concentrations detected in the corrective action monitoring wells. Under the current Corrective Action Plan, the concentrations of key constituents of concern, as detected in each of the six monitoring wells, will be plotted to allow evaluation of temporal changes in concentration. Each plot will consist of a horizontal axis that represents time with year and month identified at intervals. The vertical axis will represent the constituent concentrations. When appropriate, historical monitoring data will be used in plotting the graphs to extend the overall period of record. Following each corrective action sampling event, the graphs will be evaluated for trends that demonstrate generally decreasing or increasing constituent concentrations. The spacing of the wells in the groundwater monitoring

network will allow the efficiency of the corrective action to be measured at points along the plume boundary, within the plume, and at the point of compliance.

At the time of application submittal, IP and NCDENR are in the process of evaluating alternative remedial approaches for the site, which may result in some modifications to this plan.

E-8d(2) Description of Sampling and Analysis Procedures

See Section 4.0 of the most recently approved Groundwater Sampling and Analysis Plan for Corrective Action and Compliance Monitoring.

E-8d(3) Monitoring Data and Statistical Analysis Procedures

E-8d(3)(a) Procedure for Establishing Background Concentration Values

See subpart E-5c of this application.

E-8d(3)b Statistical Procedures for Comparing Compliance Point Data to the Concentration limits

This will be accomplished through a direct comparison of data to the respective NCAC 2L standards.

E-8d(3)c Statistical Procedures for Evaluating Effectiveness of the Corrective Action Program

Trend analysis as described in subpart E-8d(1)(b) will be utilized to evaluate corrective action program effectiveness.

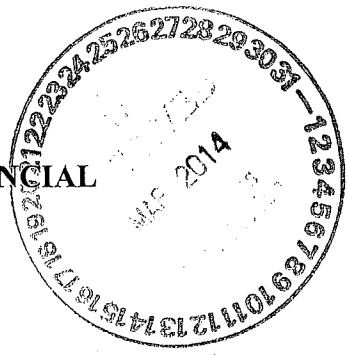
E-8d(4) Reporting Requirements

A report evaluating the effectiveness of the corrective action program will be submitted to the Solid Waste Management Division annually. The report will be submitted within 60 days of completing annual groundwater monitoring. The report will include a map illustrating contaminant extent, graphs showing trends in contamination concentrations, a potentiometric surface map depicting the extent of drawdown, the laboratory analytical reports, and the results of influent and effluent sampling conducted at the treatment system.

E-9 References

Bain, G.L., 1970, Geology and Ground-Water Resources of New Hanover County, North Carolina: North Carolina Dept. of Water and Air Resources, Ground Water Bulletin 7, 79 p.

LeGrand, H.E. and Brown, P.M., 1955, Guidebook of Excursion in the Coastal Plain of North Carolina, Oct. 8-9: North Carolina Division - Mining Resources, Special Publication, 43 p



MODULE I CLOSURE PLANS, POSTCLOSURE PLANS, AND FINANCIAL REQUIREMENTS

I-1 Closure Plans

The Revised Closure Plan, dated August 22, 1990, was given final approval after the public comment period on September 27, 1990. Closure of SWMU 14 was completed according to the plan on March 28, 1991. Certification of Closure was submitted to NCDENR on June 10, 1991. The Revised Closure Plan, NCDENR approval letter, and Certification of Closure information are included on the **attached CD.**

I-1a Closure Performance Standard

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1b Partial Closure and Final Closure Activities

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1c Maximum Waste Inventory

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1d Schedule for Closure

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-d1(1) Time Allowed for Closure

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1d(1)(a) Extensions for Closure Time

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1e Closure Procedures

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1e(1) Inventory Removal, Disposal, or Decontamination of Equipment

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1e(2) Closure of Disposal Units

SWMU 14 is not a disposal unit. This section does not apply.

I-1e(3) Closure of Containers

SWMU 14 did not store containers. This section does not apply.

I-1e(4) Closure of Tanks

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1e(5) Closure of Waste Piles

Refer to the Revised Closure Plan on the **attached CD** dated August 23, 1990.

I-1e(6) Closure of Surface Impoundments

SWMU 14 is not a surface impoundment. This section does not apply.

I-1e(7) Closure of Incinerators

SWMU 14 is not an incinerator. This section does not apply.

I-1e(8) Closure for Landfills

While SWMU 14 has been closed as a landfill, the SWMU was never designed or used as an operating disposal facility. Rather, the waste consists only of soil containing spill residue associated with former tank farm operations. There is no liner or leachate collection system associated with SWMU 14, or are there run-on/run-off controls, wind dispersal control systems, or leak detection systems. Refer to the Revised Closure

Plan on the **attached CD** dated August 23, 1990 for details describing the final cover components

I-1e(9) **Closure of Land Treatment**

SWMU 14 is not a land treatment unit. This section does not apply.

I-1e(10) **Closure of Miscellaneous Units**

SWMU 14 is not a miscellaneous unit. This section does not apply.

I-2 **Post-Closure Plan**

The Post-Closure Plan for interim status post-closure care and monitoring was submitted to the Hazardous Waste Section on August 22, 1990. Final approval of the plan was given on September 27, 1990. A request to modify the plan's groundwater monitoring schedule was approved on May 19, 1993 and a copy of the modified post-closure plan was submitted to the Hazardous Waste Section on June 15, 1993. Post-closure activities during interim status were conducted according to the approved plan. Following issuance of the Post-Closure Permit, post-closure activities were performed according to the Post-Closure Plan, dated March 1998. The Post-Closure Plan and post closure NCDENR approval is included **on the attached CD.**

I-2a **Inspection Plan**

Refer to the Post-Closure Plan on the **attached CD** dated March 1998.

I-2b **Monitoring Plan**

Refer to the Post-Closure Plan on the **attached CD** dated March 1998 and Module E-1b of the permit application for a description of the sampling/analysis procedures.

I-2c **Maintenance Plan**

Refer to the Post-Closure Plan on the **attached CD** dated March 1998.

I-2d **Land Treatment**

SWMU 14 is not a land treatment unit. This section does not apply.

I-2e **Post-Closure Care for Miscellaneous Units**

SWMU 14 is not a miscellaneous unit. This section does not apply.

I-2f **Post-Closure Security**

Refer to the Post-Closure Plan on the **attached CD** dated March 1998.

I-2g **Post-Closure Contact**

International Paper

Mr. Tom Richardson
6400 Poplar Avenue
Memphis, TN 38197

I-3 **Notices Required for Disposal Facilities**

I-3a **Certification of Closure**

Certification of Closure was submitted to NCDENR on June 10, 1991 and the information in included **on the attached CD**.

I-3b **Survey Plat**

Refer to the information presented in Module I-3a of the permit application.

I-3c **Notice to Local and Authority**

Refer to the information presented in Module I-3a of the permit application.

I-3d **Post-Closure Certification**

Post-Closure Certification can not be provided until the conditions of the permit have been satisfied.

I-3e **Notice in Deed to Property**

Refer to the information presented in Module I-3a of the permit application.

I-4 **Closure Cost Estimate**

SMWU 14 is already closed. No additional closure costs are required.

I-5 **Financial Assurance Mechanism for Closure**

Closure was completed in March 1991. Financial assurance is not required for activities considered completed.

I-5a **Closure Trust Fund**

Closure was completed in March 1991. This section does not apply.

I-5b **Surety Bond**

Closure was completed in March 1991. This section does not apply.

I-5c **Closure Letter of Credit**

Closure was completed in March 1991. This section does not apply.

I-5d **Closure Insurance**

Closure was completed in March 1991. This section does not apply.

I-5e **Financial Test and Corporate Guarantee for Closure**

Closure was completed in March 1991. This section does not apply.

I-5f **Combinations**

Closure was completed in March 1991. This section does not apply.

I-5f(1) **Use of Multiple Financial Mechanisms**

Closure was completed in March 1991. This section does not apply.

I-5f(2) **Use of Financial Mechanism for Multiple Facilities**

Closure was completed in March 1991. This section does not apply.

I-6 **Post-Closure Cost Estimate**

The annual cost for post-closure care is estimated at $40,000 (see table below). The estimate includes costs associated with: inspecting SWMU 14; maintaining SWMU 14; inspecting the groundwater monitoring system; groundwater monitoring including sampling and analysis; and administering post-closure care activities. The estimate is based on current 2006 dollars utilizing fully loaded labor rates.

ITEM	LABOR	EXPENSES	TOTALS
Inspection and Maintanence (One Event)	$750	$100	$850
Groundwater Sampling (One Event)	$9,000	$5,000	$14,000
Report Prepartation (One Report)	$15,000	$500	$15,500
Laboratory Subcontractor	$0	$9,650	$9,650
TOTALS	**$24,750**	**$15,250**	**$40,000**

I-7 Financial Assurance Mechanism for Post-Closure

The financial assurance mechanism selected for post-closure is the financial test described in Subpart I-7e.

I-7a Post-Closure Trust Fund

Not selected.

I-7b Surety Bond

Not selected.

I-7c Post-Closure Letter of Credit

Not selected.

I-7d Post-Closure Insurance

Not selected.

1-7e Financial Test and Corporate Guarantee for Post-Closure

International Paper is currently providing financial assurance for post-closure through the financial test and corporate guarantee. The financial assurance test for the post-closure cost estimate under interim status is documented in the Financial Assurance correspondence from International Paper's Chief Financial Officer dated March 31, 2006 located in **Attachment I-1**. Financial assurance for post-closure activities under the Post-Closure Permit will also be provided through the financial test and corporate guarantee.

I-7f Combinations

Not selected.

I-7f(1) **Use of Multiple Financial Mechanisms**

Not selected

I-7f(2) **Use of Financial Mechanism for Multiple Facilities**

Not selected.

I-8 **Liability Requirements**

I-8a **Sudden Insurance**

Not applicable. According to 40 CFR 264.147(e), which has been adopted by reference into the North Carolina Hazardous Waste Management Rules, liability coverage is not required after closure has been completed accordance with the approved closure plan.

I-8b **Nonsudden Insurance**

Not applicable. According to 40 CFR 264.147(e), which has been adopted by reference into the North Carolina Hazardous Waste Management Rules, liability coverage is not required after closure has been completed in accordance with the approved closure plan.

I-8c **Variance Procedures and R.A. Adjustments**

Not applicable. No variance or requests are being requested.

I-9 **State Financial Mechanism**

I-9a **Use of State-Required mechanisms**

Not applicable.

I-9b **State Assumption of Responsibility**

Not applicable.

ATTACHMENT I-1

Financial Assurance Documentation